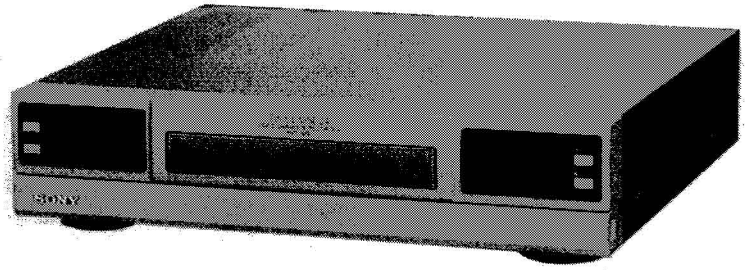
SVT-100

SERVICE MANUAL

US Model
Canadian Model



SPECIFICATIONS

General

Recording method	Dual-head rotating helical scanning system
Audio recording	In 2-, 12-, and 24-hour modes
Tape speed	33.35 mm/sec (2-hour mode)
Specified video cassette tape	VHS 1/2in. video cassette tape
Recording/playback time	2, 12 and 24 hours (when using T-120 tape)
Fast-forward/rewind time	Approx. 5 minutes (when using T-120 tape)
Television system	NTSC color TV system

Video

Recording method	Luminance signal: FM method Color signal: Low-pass band-pass Transformation direct recording method
Input	1 Vp-p, BNC, 75 ohms unbalanced
Output	1 Vp-p, BNC, 75 ohms unbalanced
Horizontal resolution	Black & white mode: 280 lines or more Color mode: 240 lines or more

Audio

Input	346 mV (–7.0 dBs), phono jack 47 kilohms unbalanced
Output	346 mV (–7.0 dBs), phono jack 600 ohms unbalanced
Microphone input	–60 dBs, 3.5 mm minijack, high impedance

Connector

Alarm input	Low level
Alarm output	+5 V, 4.7 kilohms (Low active)
Tape end output	+5 V, 4.7 kilohms (Low active)
Switch output	+5 V, 4.7 kilohms (Low active)
Remote control input	3.5 mm minijack

Other specifications

Operating temperature range	5° C to 40° C
Operating humidity range	80% or less
Power supply	120 V AC, 60 Hz
Power consumption	18 W
External dimensions	Approx. 420 × 100 × 340 mm (w/h/d) (16 5/8 × 4 × 13 1/2 in.)
Weight	Approx. 5.7 kg (12 lb 9 oz)

Design and specifications are subject to change without notice.

TIME LAPSE
VIDEO CASSETTE RECORDER

SONY®

MICROFILM

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the coustomer.
6. Check the B + voltage to see it is at the values specified.
7. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

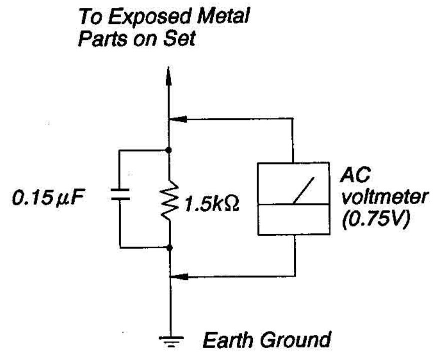


Fig. A. Using an AC voltmeter to check AC leakage.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturer's instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job..
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75V, so analog meters must have an accurate lowvoltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

SAFETY - RELATED COMPONENT WARNING!!

WARNING!! COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUB- LISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÈCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÉCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÉCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

CAUTION

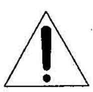
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,

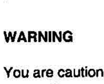
DO NOT REMOVE COVER (OR BACK).

NO USER-SERVICEABLE PARTS INSIDE.

REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

Note:
This equipment has been tested and found to comply with the limits for a Class A digital device , pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

For the customers In Canada

This apparatus complies with the Class A limits for radio noise emissions set out in Radio Interference Regulations.

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SECTION 1
GENERAL

This section is extracted from instruction manual.

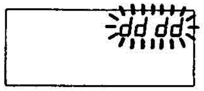
Precautions

On safety
- Operate the unit on 120 V AC, 60 Hz.
- Should anything fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- If you are not using the unit for an extended period of time, unplug it from the wall outlet by pulling it out by the plug. Never pull the cord itself.

On installation
- Do not place the unit on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation slots.
- Do not install the unit near heat sources such as radiators or air ducts, or in a place subject to direct sunlights, excessive dust, mechanical vibration or shock.
- The unit is designed for operation in a horizontal position. Do not install it in an inclined position.
- Allow adequate air circulation to prevent internal heat buildup.
- Keep the unit and cassette tape away from equipment with strong magnets, such as microwave ovens or large loudspeakers.
- Do not place any heavy object on the unit.

On operation
When the unit is not in use, turn the power off to conserve energy and to extend its life.

On moisture condensation
If the unit is brought directly from a cold to a warm location, moisture may condense on the video head drum. In this condition, the tape may adhere to the head drum and cause serious damage to the head. To avoid damage caused by moisture condensation, be sure not to leave a cassette inside the compartment when the unit will not be used.
If moisture condensation is present, the "dddd" indicator flashes in the display window and the unit will not operate.
When the "dddd" indicator disappears, you can operate the unit.



On video cassettes
Remove and store video cassettes after recording or playback.

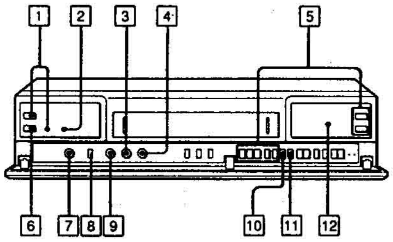
On cleaning
- Clean the cabinet, panel and controls with a dry, soft cloth, or a soft cloth slightly moistened with a mild detergent solution.
- Do not use any type of solvent, such as alcohol or benzine, which may damage the finish.

If you have any questions about the unit, contact your Sony dealer.

Labeling Parts and Controls

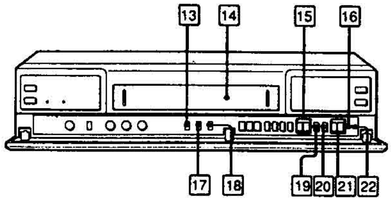
Refer to pages in parentheses for details.

Front Panel



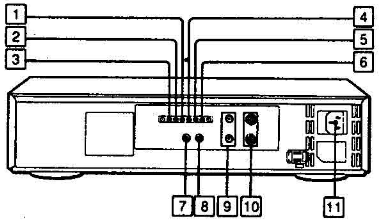
1. POWER switch and indicator
2. REPEAT indicator (9)
3. TRACKING NORMAL control (17)
4. TRACKING SLOW control (17)
5. Tape operation buttons
   - ◄◄ REW button
   - ► PLAY button
   - ►► FF button
   - II PAUSE/AL SCAN button
   - ◄ REV button
   - ● REC button
   - ■ STOP button
6. ≜ EJECT button (7)
7. SHARPNESS control (16)
8. PL RESET button (10)
9. STILL ADJUST control (18)
10. II► ADV/AUDIO ON button (16), (18)
11. PAGE button (6), (10), (11), (15)
12. Display window (23)

Front Panel



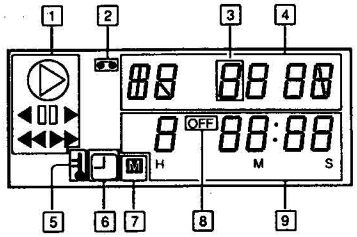
13. ALARM DURATION switch (13)
14. Cassette compartment (7)
15. SHIFT ▼/► buttons (6), (11)
16. AL RESET button (14), (15)
17. REPEAT REC switch (9)
18. TIMER REC (recording) switch (12)
19. COUNTER RESET button (17)
20. COUNTER MEMORY button (17)
21. REC/PLAY SPEED –/+ buttons (6), (11)
22. T/D (time/date) RESET button (5)

Rear Panel



1. SW OUT (switch out) terminal (20)
2. GND (ground) terminal (20)
3. TAPE END terminal (21)
4. ALARM IN terminal (13)
5. ALARM GND (ground) terminal (13)
6. ALARM OUT terminal (13)
7. REMOTE jack (mini type) (20)
8. MIC IN jack (mini type) (4)
9. AUDIO IN/OUT jacks (phono type)
10. VIDEO IN/OUT jacks (BNC type) (4)
11. AC IN (inlet) (4)

Display Window


1
2
3
4
OFF
H
M
S
5
6
7
8
9

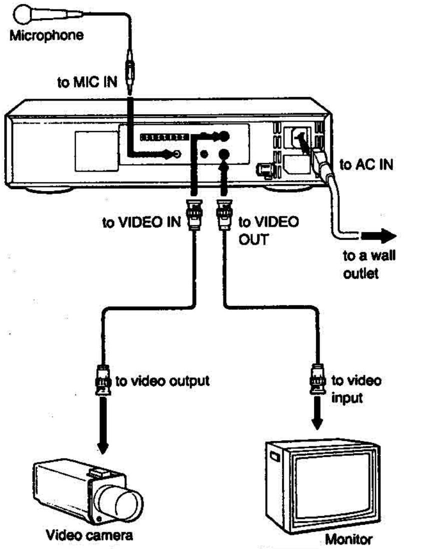
1. Tape operation indicators
2. Cassette indicator
3. Power interruption indicator
4. Tape speed/Alarm/Moisture condensation
5. Security lock indicator
6. ⏲ (timer recording standby) indicator
7. [M] (memory) indicator
8. OFF indicator
9. Linear time counter/Timer recording indicator

Connections

Turn all the power off before making connections.
Connect the AC power cord last.

Connecting a camera, monitor and microphone

With the following connections, you can monitor the picture and sound.

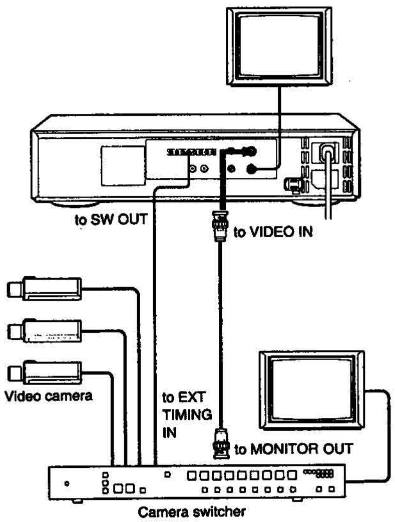

Microphone
to MIC IN
to AC IN
to VIDEO IN
to VIDEO OUT
to a wall outlet
to video output
to video input
Video camera
Monitor

Use of BNC connector

Align pin with cutout, insert and turn right to lock.
To remove, turn left and pull out.

For alarm sensor connection, refer to page 13.

Connecting a Switcher

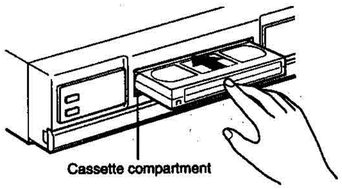

to SW OUT
to VIDEO IN
Video camera
to EXT TIMING IN
to MONITOR OUT
Camera switcher

Note
When you connect several cameras to a switcher, synchronize the cameras.
If not, the picture will be disturbed.

Handling a Video Cassette

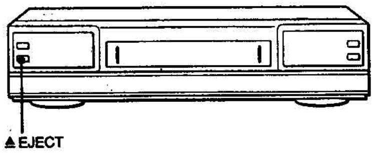
This section shows you how to insert a video cassette into the VCR.

Inserting a Video Cassette


Cassette compartment

Insert the cassette into the cassette compartment by slowly pressing its center with the arrow on the top.
When the cassette is inserted, the VCR automatically turns on and the ◐ indicator lights in the display window.
If you insert the cassette without its safety tab for recording, the VCR ejects the cassette automatically.

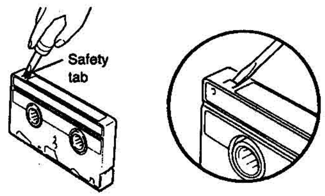
Ejecting the video cassette



Press ≜ EJECT on the VCR.
You can eject the cassette even when the power is off.
When you press ≜ EJECT, the VCR turns on automatically.
After ejecting the cassette, the VCR turns off again.

Recommended cassette
This VCR is designed and calibrated with 120-minute tape (Sony T-120). To ensure stable operation and optimum picture quality, we recommend that you use a Sony 120-minute tape.

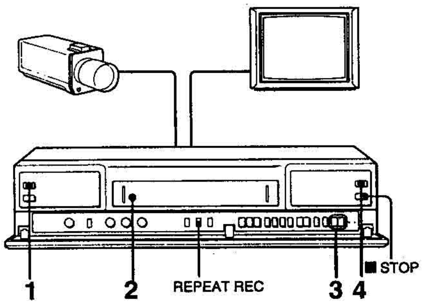
Protecting your cassette from being erased
Remove the tab on the cassette with a screwdriver or a similar tool as shown below. This protects your cassette against an accidental recording.



If you want to record again on the cassette without its safety tab, simply cover the safety tab hole with a piece of plastic tape.

Recording

This section shows you how to record the signal from the video camera in the normal or time lapse mode, to set the security lock and to record repeatedly on the same cassette.

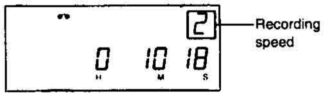


1 Turn on the power of the equipment to be used.

2 Insert the cassette.

3 Set the recording speed by pressing REC/PLAY SPEED +/–.

Recording speed	Maximum recording time with 120-minute tape (hour)		Interval (sec.)	Audio recording	Tape motion
2	Standard mode	2	1/60	Possible	Continuous
12	Time lapse mode	12	0.1		
24		24	0.2		



In the display window

4 Press ● REC.
Recording starts.

To stop recording
Press ■ STOP.

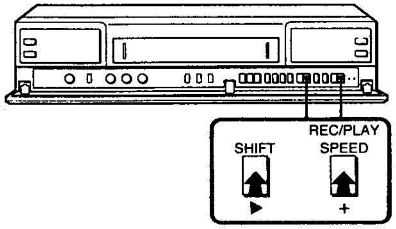
If recording does not start and the cassette is ejected
The tab on the cassette is removed to protect against accidental recording.

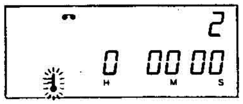
When the tape reaches the end
When REPEAT REC is set to OFF (see page 9), the tape is rewound to the beginning of the tape and stops. The OFF indicator lights in the display window.
Press ● REC, ►► FF, ◄◄ REW or ► PLAY to turn off the OFF indicator.

Locking the Record Mode – Security Lock Function

Locking the record mode is useful to guard against accidental recording interruptions when the VCR is used for surveillance or monitoring purposes.

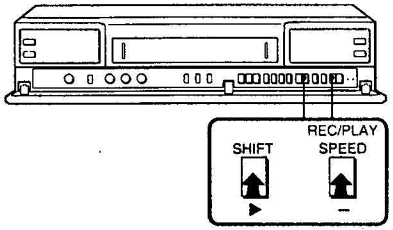
To set the security lock
While pressing SHIFT ►, press REC/PLAY SPEED +.
The 🔒 indicator lights in the display window.





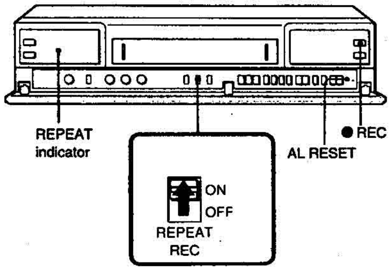
The security lock function also works in timer recording and playback modes.
The buttons and controls that you can use while security lock function is working
- SHARPNESS control
- TRACKING control
- STILL ADJUST control

To release the security lock
While pressing SHIFT ►, press REC/PLAY SPEED –.
The 🔒 indicator turns off.



Recording on the Same Cassette Repeatedly – Auto Repeat Recording

Before operation
Check that the alarm count indicator shows "000". If not, press AL RESET with a ball point pen or similar object. (For details on Alarm Recording, see page 13.)



1 Set REPEAT REC to ON.

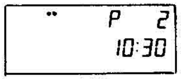
2 Press ● REC.
The REPEAT indicator lights and recording begins.
When the tape reaches the end, the tape is rewound at the beginning and recording resumes.

If the VCR receives an alarm signal during auto repeat recording
The recording mode switches to alarm recording (the REPEAT indicator disappears.) When the tape reaches the end, the tape is rewound and stops at the beginning.
The OFF indicator lights in the display window.

If REPEAT REC is set to OFF while auto repeat recording is in progress
Recording proceeds until the tape reaches the end and then stops automatically after the tape is rewound to the beginning. The OFF indicator lights in the display window.

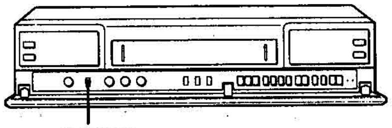
Recording after Power Interruption

If a power interruption occurs, the P indicator lights in the display window. Even if a power interruption occurs while recording, the internal batteries provide backup power for memory for at least 72 hours.
If the power is interrupted during recording, the recording starts automatically after power is restored. The internal batteries can be charged in about 48 hours.



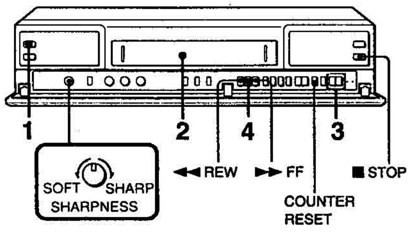
In the display window

To clear the P indicator



Press PL RESET.

Playback



1. Turn on the power of the equipment to be used.
2. Insert the cassette.
3. Select the playback speed by pressing REC/PLAY SPEED –/+.
   The selected playback speed is displayed in the display window.
4. Press ► PLAY.
   Playback starts.

To stop playback
Press ■ STOP.

To rewind the tape
Press ■ STOP and then ◄◄ REW.

To fast-forward the tape
Press ■ STOP and then ►► FF.

To adjust the sharpness of the picture
Turn SHARPNESS to SHARP for a sharper picture or to SOFT for a softer picture.

Resetting the tape counter
The tape counter in the display window helps you to locate a certain scene after playback. Press COUNTER RESET to set the counter to "0H00M00S" (counter zero) position before playing back the tape. The VCR keeps counting the length of the tape being played back. Note, however, that the tape counter will not count the portions without video signals.

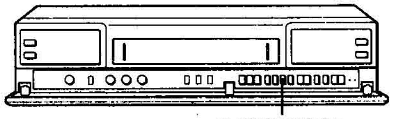
Note
You cannot play back the tapes recorded on other time-lapse VCR on this VCR and vice versa.

Audio Playback

You can play back the sound with the picture.
Play back the tape at the same speed at which it was recorded so that you can monitor the sound normally.

For audio playback in 2-hour mode
Play back the tape normally.

For audio playback in 12-hour or 24-hour mode
Press II►ADV/AUDIO ON in playback mode.
"A12" or "A24" is displayed in the display window.
To turn off the sound, press II►ADV/AUDIO ON again.



Note
Noise appears on the screen and the sound is distorted when you play back the picture in 12- or 24-hour mode.

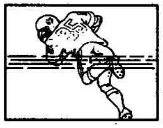
Playback speed
If you select a different playback speed from the recording speed, the playback speed changes as follows.

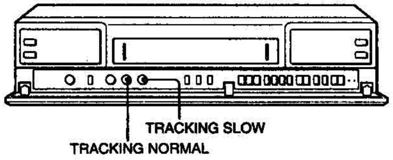
Recording speed (H)	Playback speed (H)		
	2	12	24
2	1	1/6	1/12
12	6	1	1/2
24	12	2	1

For example, when a tape recorded in 24-hour mode is played back in 2-hour mode, you can view the playback picture at a speed 12 times faster than the recorded one.

Adjusting Pictures

If streaks or noise bands appear on the playback picture, adjust the tracking condition.



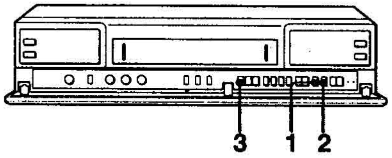


For the picture-recorded in 2-hour mode: Use TRACKING NORMAL.

For the picture recorded in 12- or 24-hour mode: Use TRACKING SLOW.

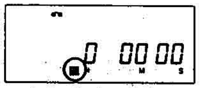
Locating the Counter Zero Point

The VCR can memorize the counter zero point and can automatically stop at that point. Thus, you can search for a desired point quickly during playback.



1. During playback or recording, press COUNTER RESET at the point you want to locate later.
   The counter in the display window shows "0H00M00S".

2 After playback or recording, press COUNTER MEMORY so that the Ⓜ indicator appears in the display window.



In the display window

3 Press ◀◀ REW.
The VCR rewinds the tape and stops automatically at the position close to the counter zero point.

If you press ◀◀ REW again, the VCR shows a negative counter value. To locate the counter zero point, press ▶▶ FF.

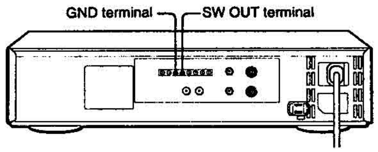
To cancel the memory of the counter zero point

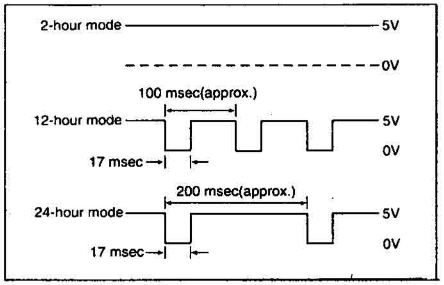
Press COUNTER MEMORY again.

Notes
- The counter does not work for unrecorded portions of a tape.
- The counter works as a linear time counter only where the recording is 2-hour mode, indicating the tape movement in terms of hours, minutes and seconds.
  For other recording speeds, the counter reflects the ratio of the recording speed to that of 2-hour mode. For example, in 12-hour mode, each second on the counter reflects six actual seconds (12/2=6).
- There may be a slight discrepancy between the position shown on the tape counter and the actual tape position.
- If ● REC is pressed, the memory of the counter zero point is cleared.

SW OUT Terminal

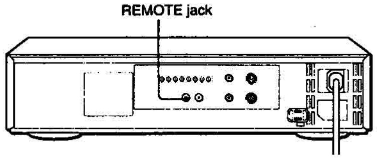
The VCR outputs a pulse signal from the SW (switch) OUT terminal every time one field of intermittent recording in 12- or 24-hour mode is made.


GND terminal
SW OUT terminal

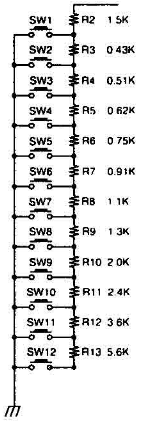


REMOTE Jack

The VCR can be remotely controlled by adding the circuit shown below to the REMOTE jack.


REMOTE jack

SW1 .... STOP
SW2 .... PAUSE
SW3 .... REW
SW4 .... FF
SW5 .... PLAY
SW6 .... REC
SW7 .... PAGE
SW8 .... REV
SW9 .... REC/PLAY SPEED+
SW10 .... REC/PLAY SPEED-
SW11 .... SHIFT▼
SW12 .... SHIFT▶

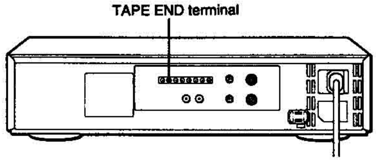

SW1
R2 1.5K
SW2
R3 0.43K
SW3
R4 0.51K
SW4
R5 0.62K
SW5
R6 0.75K
SW6
R7 0.91K
SW7
R8 1.1K
SW8
R9 1.3K
SW9
R10 2.0K
SW10
R11 2.4K
SW11
R12 3.6K
SW12
R13 5.6K

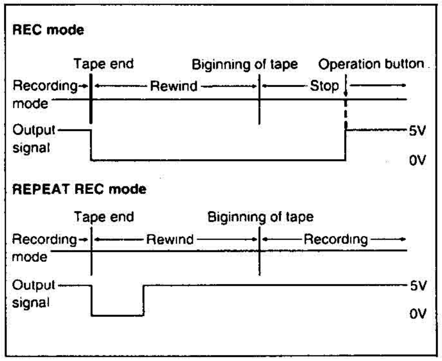
Resistor tolerance should be equal to or less than ± 2%

Note
Use the shielded cord less than 5 m (16 ft.) in length.

TAPE END Terminal

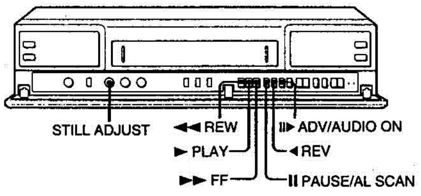
When the VCR detects the tape end during recording, the output level becomes 0 V DC and the OFF indicator works. To resume the 5 V output, press the operation button (● REC, ▶▶ FF, ◀◀ REW or ▶ PLAY).


TAPE END terminal



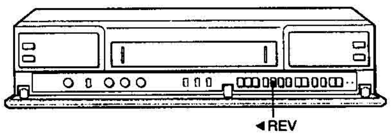
Various Playback Modes

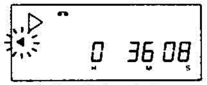
You can play back picture at various modes: reverse playback, still and field by field pictures, and high-speed playback in both forward and reverse directions.



Reverse Playback

During playback, keep pressing ◄REV. Reverse playback picture appears on the screen.





In the display window

Note
During reverse playback, streaks appear on the monitor screen.

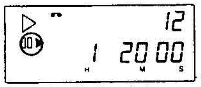
Still Picture

During playback, press II PAUSE/AL SCAN.
To resume normal playback, press II PAUSE/AL SCAN or ► PLAY.
When the still mode lasts for more than approximately five minutes, the VCR will automatically enter the playback mode.

If the picture shakes while in the still mode
Adjust the picture with STILL ADJUST.

Field-by-Field Picture

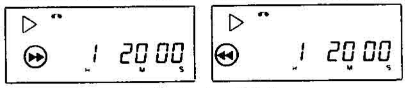
In the still mode, press II►ADV/AUDIO ON.
Each time you press the button, the picture advances by one field.



In the display window

Picture Search

During playback, press ►► FF (forward direction) or ◄◄ REW (reverse direction). A high-speed picture (about five times the normal speed in 2-hour mode) without sound appears on the monitor screen.
To resume normal playback, press ► PLAY.

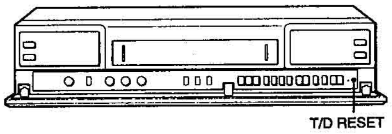

When ►► FF is pressed
When ◄◄ REW is pressed

In the display window

Note
During picture search, streaks or noise band appear on the monitor screen.

Resetting the Memory

When you use this VCR for the first time or place it in a new location, reset the memory.



Turn on the power and press T/D RESET.
When the memory is reset, the time/date setting are erased and the security lock function is released.
The VCR is automatically turned off.

SECTION 2
DISASSEMBLY

2-1. REMOVAL OF UPPER CASE

It is widen on both sides the back of upper case and remove up direction.

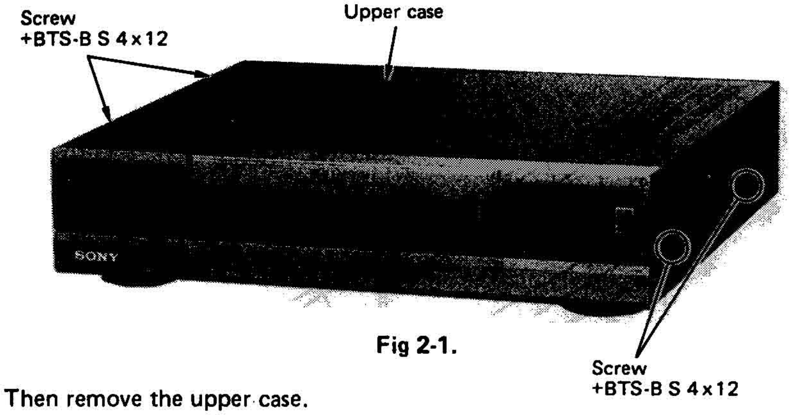

Screw
+BTS-B S 4x12
Upper case
SONY
Screw
+BTS-B S 4x12

Fig 2-1.

Then remove the upper case.

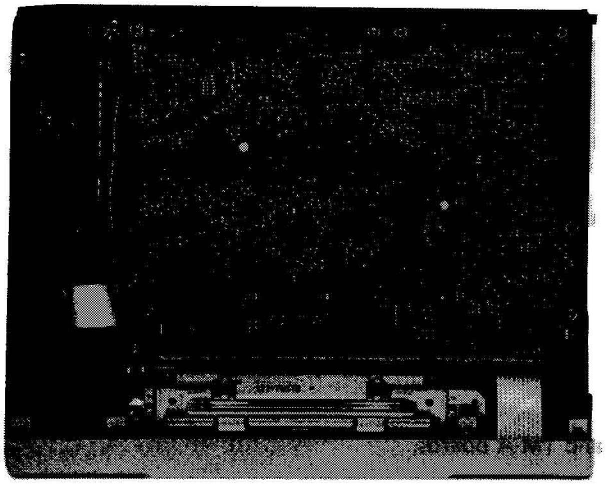


Fig 2-2.

2-2. REMOVAL OF BOTTOM PLATE

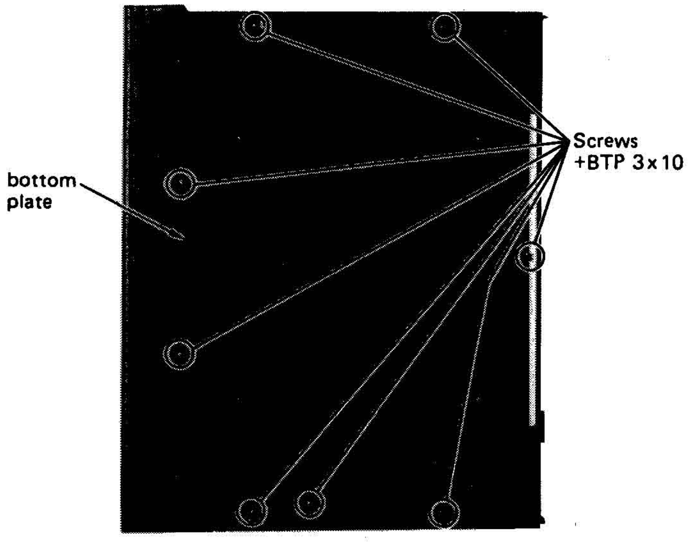

bottom
plate
Screws
+BTP 3x10

Fig 2-3.

Then remove the bottom plate.

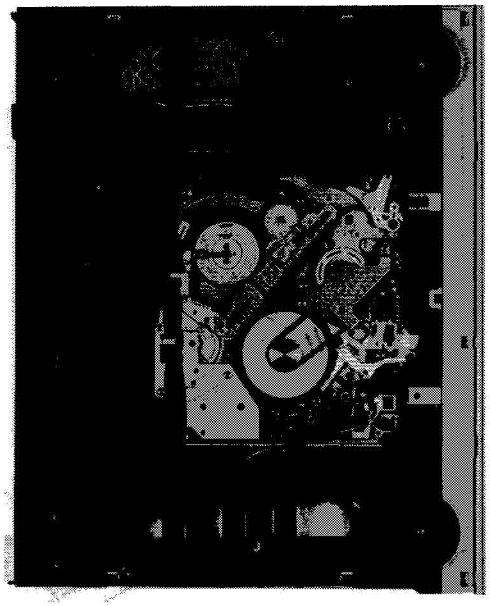
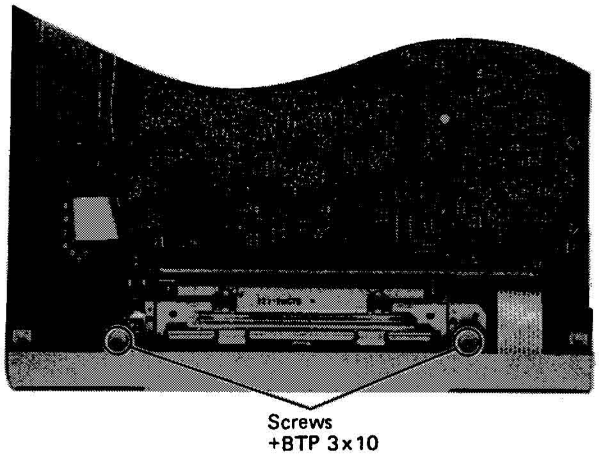


Fig 2-4.

2-3. REMOVAL OF FRONT CABINET

Then remove the upper case, and screws (+BTP 3x10), bottom plate and raise up the claws of front cabinet as shown by Fig 2-5, and remove front cabinet in the arrow direction.


Screws
+BTP 3x10

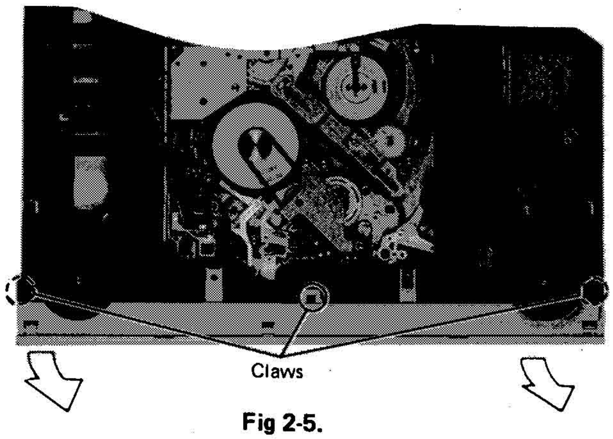
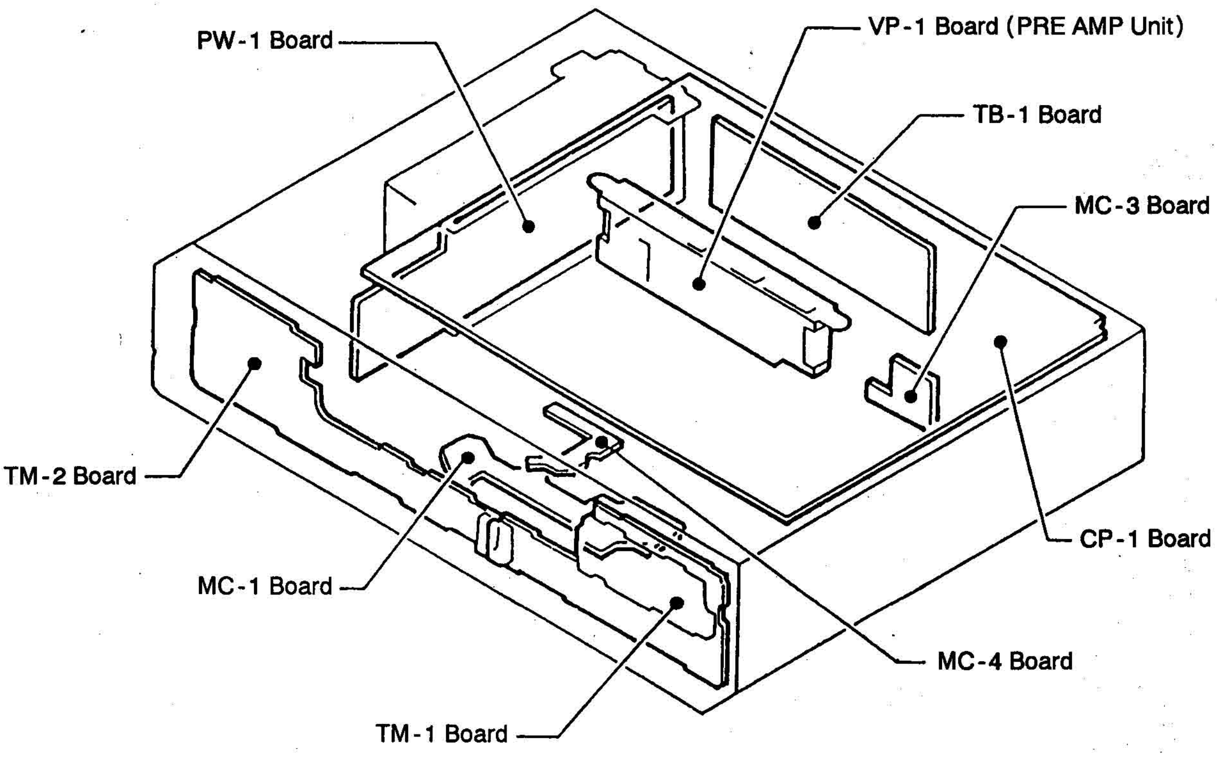


Fig 2-5.

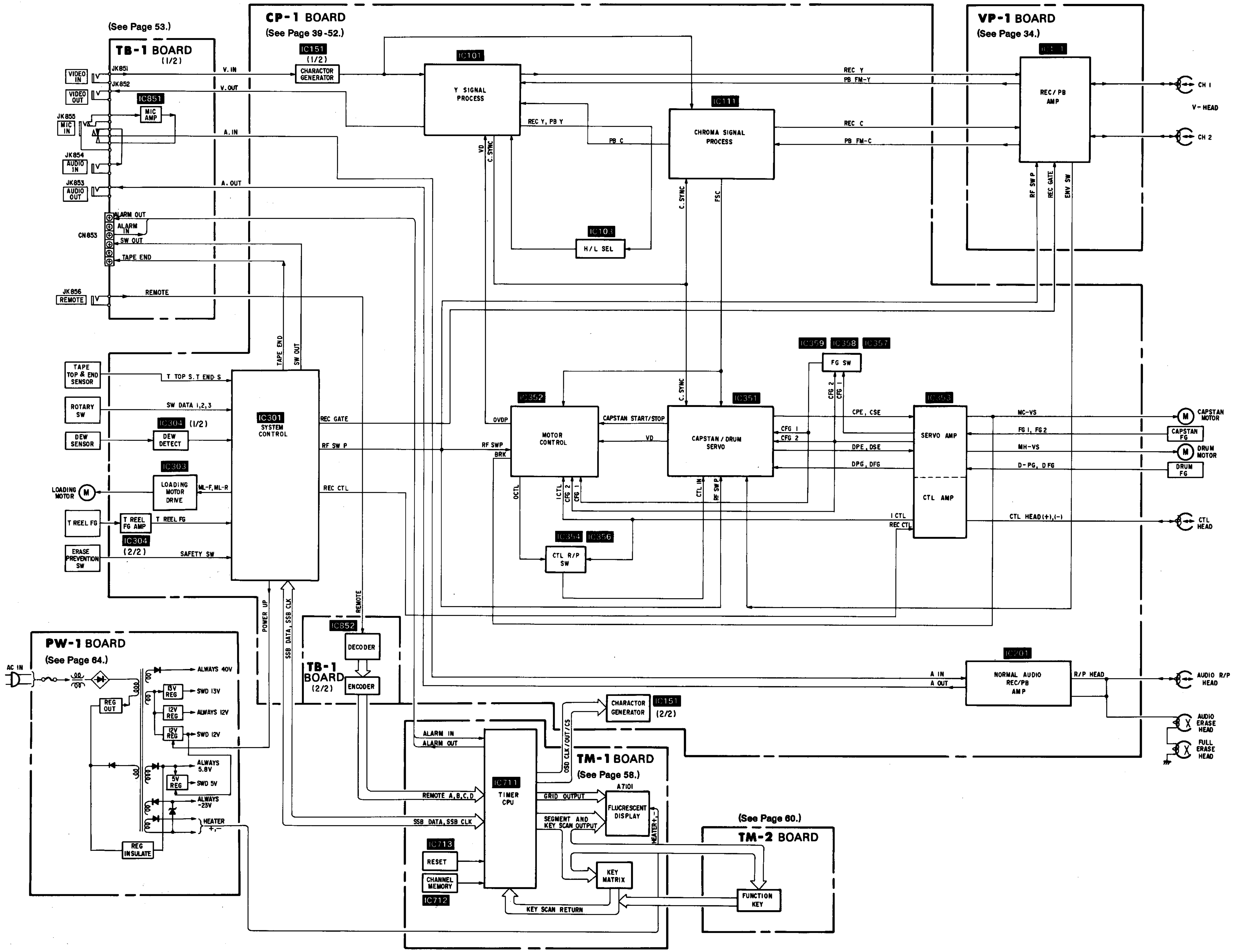
SECTION 3
DIAGRAMS

3-1. CIRCUIT BOARD LOCATIONS


PW-1 Board
VP-1 Board (PRE AMP Unit)
TB-1 Board
MC-3 Board
TM-2 Board
CP-1 Board
MC-1 Board
MC-4 Board
TM-1 Board

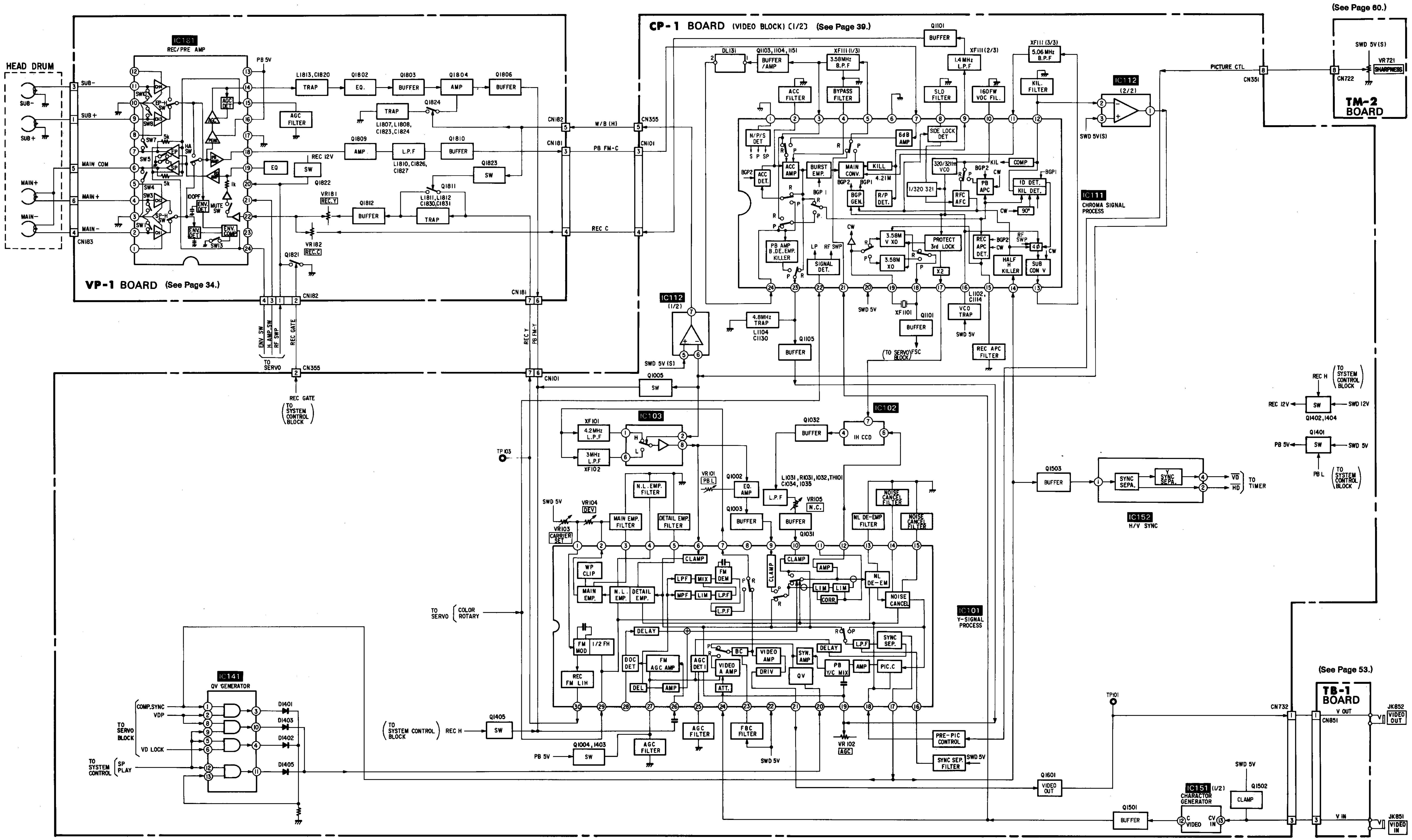
Note: CP-1 board contains VD-A, SY-A, SV-A, AD-A and TM-A boards.

3-2. OVERALL BLOCK DIAGRAM



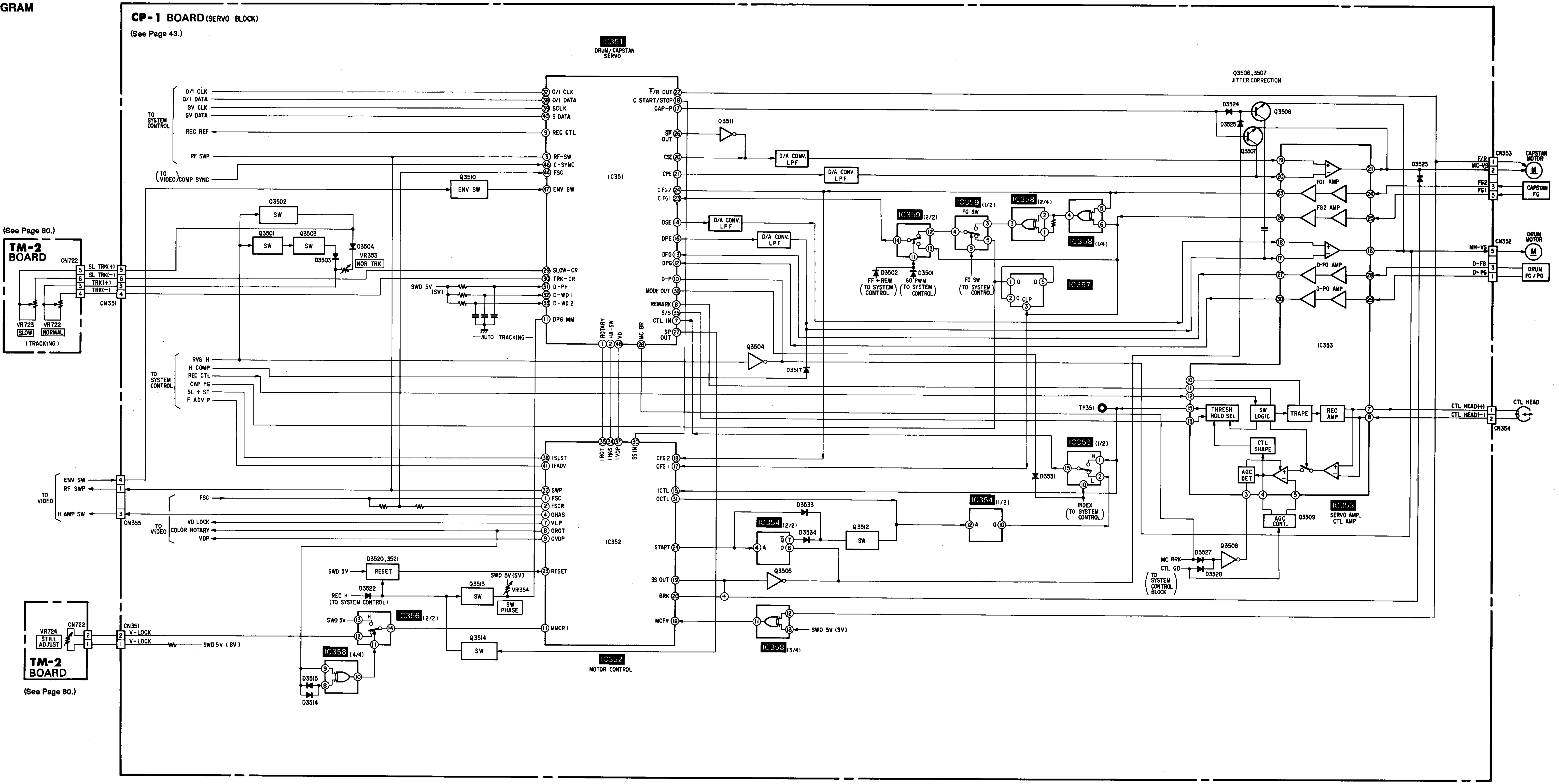
TB-1 BOARD (1/2)
(See Page 53.)
CP-1 BOARD
(See Page 39-52.)
VP-1 BOARD
(See Page 34.)
PW-1 BOARD
(See Page 64.)
TB-1 BOARD (2/2)
TM-1 BOARD
(See Page 58.)
TM-2 BOARD
(See Page 60.)
VIDEO IN
VIDEO OUT
MIC IN
AUDIO IN
AUDIO OUT
REMOTE
JK851
JK852
JK855
JK854
JK853
JK856
CN853
IC851 MIC AMP
V. IN
V. OUT
A. IN
A. OUT
ALARM OUT
ALARM IN
SW OUT
TAPE END
REMOTE
IC151 (1/2) CHARACTOR GENERATOR
IC101 Y SIGNAL PROCESS
IC111 CHROMA SIGNAL PROCESS
IC103 H/L SEL
REC Y, PB Y
PB C
VD
C. SYNC
FSC
REC Y
PB FM-Y
REC C
PB FM-C
REC/PB AMP
RF SW P
REC GATE
ENV SW
CH 1
V-HEAD
CH 2
TAPE TOP & END SENSOR
ROTARY SW
DEW SENSOR
LOADING MOTOR
T REEL FG
ERASE PREVENTION SW
T TOP S, T END S
SW DATA 1,2,3
IC304 (1/2) DEW DETECT
IC303 LOADING MOTOR DRIVE
ML-F, ML-R
T REEL FG AMP
T REEL FG
IC304 (2/2)
SAFETY SW
IC301 SYSTEM CONTROL
TAPE END
SW OUT
REC GATE
RF SW P
REC CTL
POWER UP
SSB DATA, SSB CLK
REMOTE
IC352 MOTOR CONTROL
IC351 CAPSTAN/DRUM SERVO
IC359 IC358 IC357 FG SW
IC353 SERVO AMP
CTL AMP
IC354 IC356 CTL R/P SW
DVDP
RF SWP
BRK
CAPSTAN START/STOP
VD
DCTL
ICTL
CFG 2
CFG 1
CTL IN
RF SWP
CFG 1
CFG 2
CPE, CSE
DPE, DSE
DPG, DFG
ICTL
REC CTL
MC-VS
FG 1, FG 2
MH-VS
D-PG, DFG
CTL HEAD(+),(-)
CAPSTAN MOTOR
CAPSTAN FG
DRUM MOTOR
DRUM FG
CTL HEAD
IC201 NORMAL AUDIO REC/PB AMP
A IN
A OUT
R/P HEAD
AUDIO R/P HEAD
AUDIO ERASE HEAD
FULL ERASE HEAD
IC852 DECODER
ENCODER
AC IN
REG OUT
8V REG
12V REG
12V REG
5V REG
REG INSULATE
ALWAYS 40V
SWD 13V
ALWAYS 12V
SWD 12V
ALWAYS 5.8V
SWD 5V
ALWAYS -23V
HEATER +,-
ALARM IN
ALARM OUT
OSD CLK/OUT/CS
CHARACTOR GENERATOR
IC151 (2/2)
IC711 TIMER CPU
REMOTE A,B,C,D
SSB DATA, SSB CLK
GRID OUTPUT
SEGMENT AND KEY SCAN OUTPUT
A7101
FLUORESCENT DISPLAY
HEATER +,-
IC713 RESET
CHANNEL MEMORY IC712
KEY MATRIX
FUNCTION KEY
KEY SCAN RETURN

3-3. VIDEO BLOCK DIAGRAM

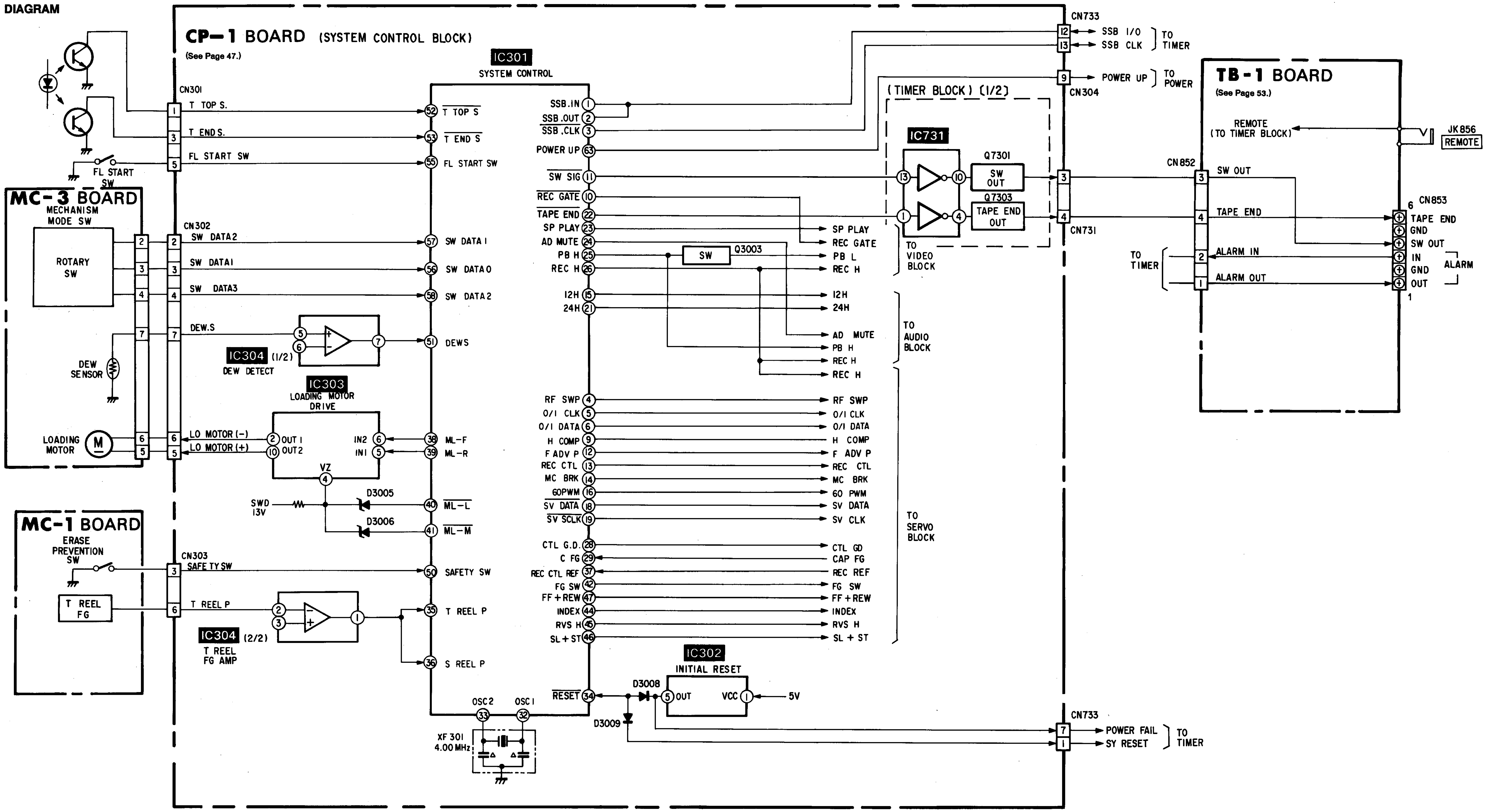


(See Page 60.)
HEAD DRUM
SUB−
SUB+
MAIN+
MAIN−
IC181 REC/PRE AMP
VP-1 BOARD (See Page 34.)
CN183
CN182
CN181
TRAP
EQ.
BUFFER
AMP
AGC FILTER
L.P.F
SW
Q1802
Q1803
Q1804
Q1806
Q1809
Q1810
Q1811
Q1812
Q1821
Q1822
Q1823
Q1824
REC 12V
PB 5V
VR181 REC Y
VR182 REC C
W/B (H)
PB FM-C
REC C
ENV SW
H.AMP SW
RF SWP
REC GATE
TO SERVO
CN355
CN101
REC GATE
(TO SYSTEM CONTROL BLOCK)
REC Y
PB FM-Y
CP-1 BOARD (VIDEO BLOCK) (1/2) (See Page 39.)
DL131
Q1101 BUFFER
Q1103, 1104, 1151 BUFFER /AMP
XF1111 (1/3) 3.58MHz B.P.F
XF1111 (2/3) 1.4MHz L.P.F
XF1111 (3/3) 5.06MHz B.P.F
ACC FILTER
BYPASS FILTER
SLD FILTER
160FW VOC FIL.
KIL. FILTER
IC112 (2/2)
PICTURE CTL
CN351
CN722
SWD 5V (S)
VR721 SHARPNESS
TM-2 BOARD
IC111 CHROMA SIGNAL PROCESS
N/P/S DET
ACC AMP
BURST EMP.
MAIN CONV.
KILL
6dB AMP
SIDE LOCK DET
320/321H VCO
PB APC
COMP
ID DET.
KIL DET.
BGP GEN.
R/P DET.
RFC AFC
90°
3.58M V XO
PROTECT 3rd LOCK
REC APC DET
HALF H KILLER
SUB CON V
PB AMP B.DE.EMP. KILLER
SIGNAL DET.
3.58M XO
X2
IC112 (1/2)
4.8MHz TRAP L1104 C1130
Q1105 BUFFER
XF1101
Q1101 BUFFER
(TO SERVO BLOCK) FSC
VCO TRAP
REC APC FILTER
Q1005 SW
SWD 5V (S)
IC103
XF101 4.2MHz L.P.F
3MHz L.P.F XF102
IC102
Q1032 BUFFER
1H CCD
TP103
VR101 PB L
Q1002 EQ. AMP
Q1003 BUFFER
L.P.F
VR105 N.C.
BUFFER
Q1031
N.L. EMP. FILTER
MAIN EMP. FILTER
DETAIL EMP FILTER
NL DE-EMP FILTER
NOISE CANCEL FILTER
VR104 DEV
VR103 CARRIER SET
SWD 5V
CLAMP
WP CLIP
MAIN EMP.
N.L. EMP.
DETAIL EMP.
LPF
MIX
LIM
MPF
FM DEM
AMP
LIM
CORR
NL DE-EM
NOISE CANCEL
IC101 Y-SIGNAL PROCESS
TO SERVO (COLOR ROTARY)
DELAY
FM MOD
1/2 FH
REC FM LIH
DOC DET
FM AGC AMP
AGC DET
BC
VIDEO AMP
SYN. AMP
DELAY
SYNC SEP.
VIDEO A AMP
DRIV
QV
PB Y/C MIX
PIC.C
DEL
ATT.
REC H
(TO SYSTEM CONTROL BLOCK)
Q1405 SW
Q1004, 1403 SW
PB 5V
AGC FILTER
FBC FILTER
VR102 AGC
SWD 5V
PRE-PIC CONTROL
SYNC SEP. FILTER
IC141 QV GENERATOR
COMP. SYNC
VDP
VD LOCK
TO SERVO BLOCK
TO SYSTEM CONTROL
SP PLAY
D1401
D1403
D1402
D1405
Q1503 BUFFER
SYNC SEPA.
V SYNC SEPA.
IC152 H/V SYNC
VD
HD
TO TIMER
REC H (TO SYSTEM CONTROL BLOCK)
REC 12V
SW
SWD 12V
Q1402, 1404
Q1401
PB 5V
SWD 5V
PB L (TO SYSTEM CONTROL BLOCK)
TP101
Q1601 VIDEO OUT
Q1501 BUFFER
IC151 (1/2) CHARACTOR GENERATOR
VIDEO
CV IN
Q1502 CLAMP
(See Page 53.)
TB-1 BOARD
CN732
CN851
V OUT
V IN
JK852 VIDEO OUT
JK851 VIDEO IN

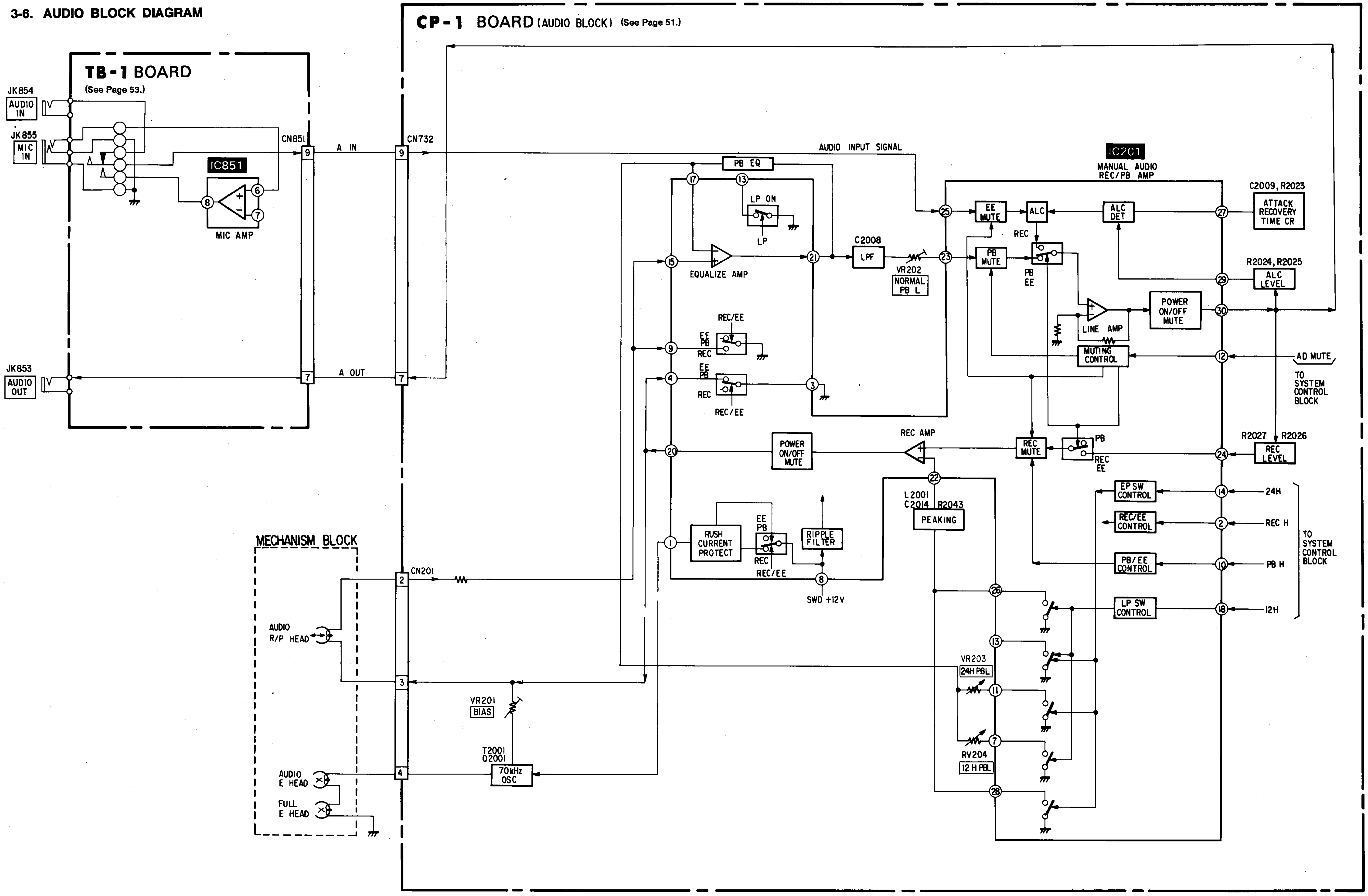
3-4. SERVO BLOCK DIAGRAM


CP-1 BOARD (SERVO BLOCK)
(See Page 43.)
IC351
DRUM/CAPSTAN SERVO
IC351
O/I CLK
O/I DATA
SV CLK
SV DATA
TO SYSTEM CONTROL
REC REF
RF SWP
(TO VIDEO) COMP SYNC
O/I CLK
O/I DATA
SCLK
S DATA
REC CTL
RF-SW
C-SYNC
FSC
ENV SW
Q3510
ENV SW
Q3502
SW
Q3501
SW
Q3503
SW
D3503
D3504
VR353
NOR TRK
SLOW-CR
TRK-CR
D-PH
D-WD 1
D-WD 2
DPG MM
SWD 5V (SV)
AUTO TRACKING
ROTARY
HA-SW
VD
MC BR
F/R OUT
C START/STOP
CAP-P
SP OUT
CSE
CPE
CFG2
CFG1
DSE
DPE
DFG
DPG
D-P
MODE OUT
REMARK
S/S
CTL IN
SP OUT
Q3511
D/A CONV. LPF
D/A CONV. LPF
D/A CONV. LPF
D/A CONV. LPF
Q3504
D3517
IC359 (2/2)
IC359 (1/2)
FG SW
IC358 (2/4)
IC358 (1/4)
IC357
Q
D
Q
CLP
D3502
FF + REW (TO SYSTEM CONTROL)
D3501
60 PWM (TO SYSTEM CONTROL)
FG SW (TO SYSTEM CONTROL)
Q3506, 3507
JITTER CORRECTION
D3524
D3525
Q3506
Q3507
FG1 AMP
FG2 AMP
D-FG AMP
D-PG AMP
D3523
IC353
CN353
F/R
MC-VS
FG2
FG1
CAPSTAN MOTOR
M
CAPSTAN FG
CN352
MH-VS
D-FG
D-PG
DRUM MOTOR
M
DRUM FG/PG
(See Page 60.)
TM-2 BOARD
CN722
SL TRK(+)
SL TRK(−)
TRK(+)
TRK(−)
CN351
VR723
SLOW
VR722
NORMAL
(TRACKING)
RVS H
H COMP
REC CTL
CAP FG
SL + ST
F ADV P
TO SYSTEM CONTROL
TP351
THRESH HOLD SEL
SW LOGIC
TRAPE
REC AMP
CTL SHAPE
AGC DET.
AGC CONT.
Q3509
IC353
SERVO AMP, CTL AMP
CTL HEAD(+)
CTL HEAD(−)
CN354
CTL HEAD
MC BRK
CTL GD
D3527
D3528
Q3508
(TO SYSTEM CONTROL BLOCK)
IC356 (1/2)
H
L
D3531
INDEX (TO SYSTEM CONTROL)
IC354 (1/2)
A
Q
ENV SW
RF SWP
TO VIDEO
H AMP SW
CN355
FSC
TO VIDEO
VD LOCK
COLOR ROTARY
VDP
IROT
IHAS
IVDP
SS IN
ISLST
IFADV
SWP
FSC
FSCR
OHAS
VLP
OROT
OVDP
IC352
RESET
MMCR1
CFG2
CFG1
ICTL
OCTL
START
SS OUT
BRK
MCFR
IC354 (2/2)
A
Q̄
Q
D3533
D3534
Q3512
SW
Q3505
IC358 (3/4)
SWD 5V (SV)
D3520, 3521
RESET
SWD 5V
D3522
REC H (TO SYSTEM CONTROL)
Q3513
SW
SWD 5V (SV)
VR354
SW PHASE
IC356 (2/2)
SWD 5V
H
IC358 (4/4)
D3515
D3514
Q3514
SW
IC352
MOTOR CONTROL
TM-2 BOARD
VR724
STILL ADJUST
CN722
CN351
V-LOCK
V-LOCK
SWD 5V (SV)
(See Page 60.)

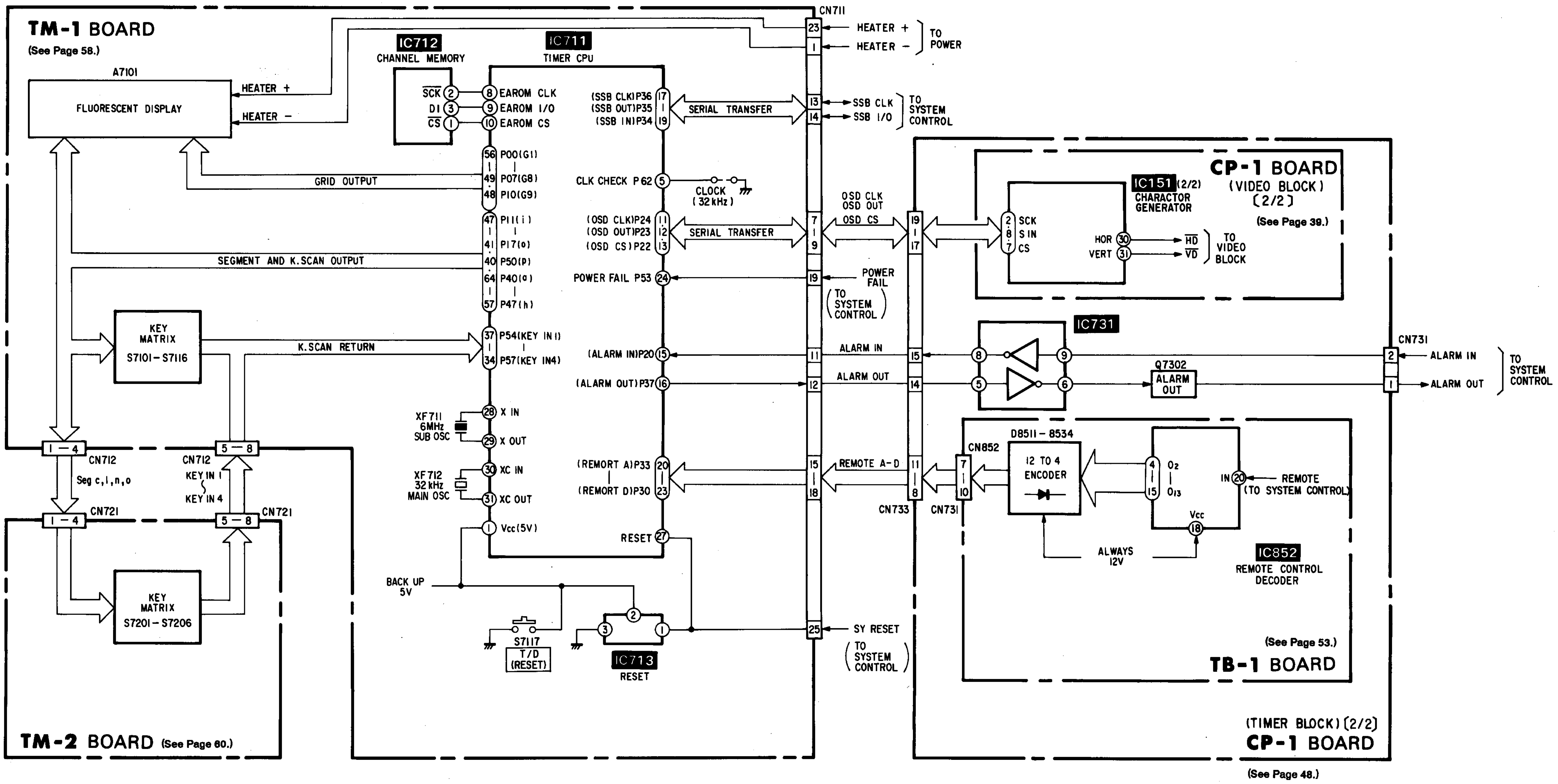
3-5. SYSTEM CONTROL BLOCK DIAGRAM


CP-1 BOARD (SYSTEM CONTROL BLOCK)
(See Page 47.)
IC301
SYSTEM CONTROL
CN301
T TOP S.
T ENDS.
FL START SW
FL START SW
MC-3 BOARD
MECHANISM MODE SW
ROTARY SW
CN302
SW DATA2
SW DATA1
SW DATA3
DEW.S
DEW SENSOR
IC304 (1/2)
DEW DETECT
IC303
LOADING MOTOR DRIVE
LOADING MOTOR
LO MOTOR (−)
LO MOTOR (+)
OUT1
OUT2
IN2
IN1
VZ
SWD 13V
D3005
D3006
MC-1 BOARD
ERASE PREVENTION SW
T REEL FG
CN303
SAFETY SW
T REEL P
IC304 (2/2)
T REEL FG AMP
T TOP S
T END S
FL START SW
SW DATA1
SW DATA0
SW DATA2
DEWS
ML-F
ML-R
ML-L
ML-M
SAFETY SW
T REEL P
S REEL P
OSC2
OSC1
XF301 4.00MHz
SSB.IN
SSB.OUT
SSB.CLK
POWER UP
SW SIG
REC GATE
TAPE END
SP PLAY
AD MUTE
PB H
REC H
12H
24H
RF SWP
0/1 CLK
0/1 DATA
H COMP
F ADV P
REC CTL
MC BRK
60PWM
SV DATA
SV SCLK
CTL G.D.
C FG
REC CTL REF
FG SW
FF+REW
INDEX
RVS H
SL+ST
RESET
SW
Q3003
SP PLAY
REC GATE
PB L
REC H
TO VIDEO BLOCK
12H
24H
AD MUTE
PB H
REC H
REC H
TO AUDIO BLOCK
RF SWP
0/1 CLK
0/1 DATA
H COMP
F ADV P
REC CTL
MC BRK
60 PWM
SV DATA
SV CLK
CTL GD
CAP FG
REC REF
FG SW
FF+REW
INDEX
RVS H
SL + ST
TO SERVO BLOCK
IC302
INITIAL RESET
OUT
VCC
5V
D3008
D3009
(TIMER BLOCK) (1/2)
IC731
Q7301
SW OUT
Q7303
TAPE END OUT
CN733
SSB I/O
SSB CLK
TO TIMER
POWER UP
TO POWER
CN304
CN731
POWER FAIL
SY RESET
TO TIMER
TB-1 BOARD
(See Page 53.)
REMOTE (TO TIMER BLOCK)
JK856
REMOTE
CN852
SW OUT
TAPE END
ALARM IN
ALARM OUT
TO TIMER
CN853
TAPE END
GND
SW OUT
IN
GND
OUT
ALARM

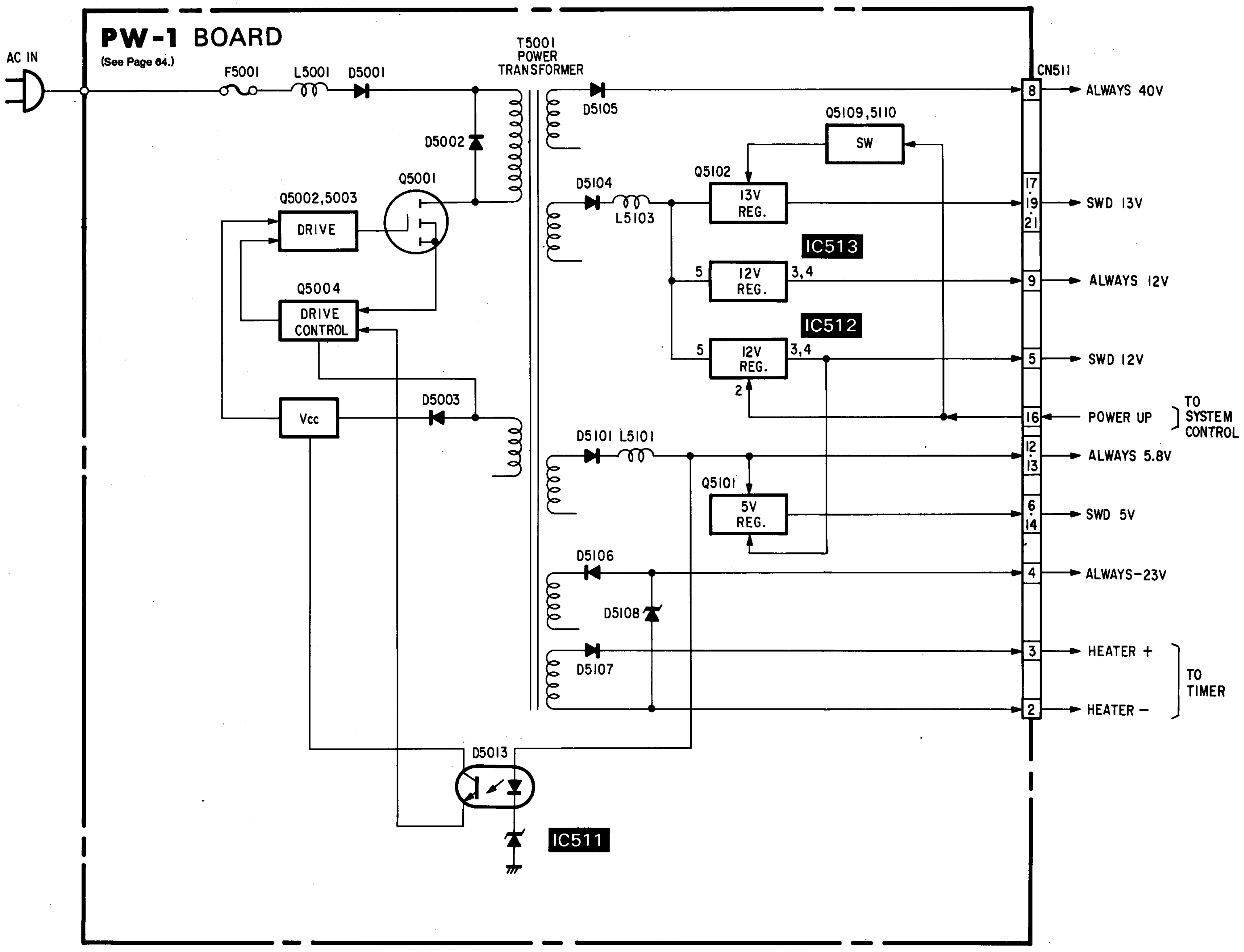
3-6. AUDIO BLOCK DIAGRAM


CP-1 BOARD (AUDIO BLOCK) (See Page 51.)
TB-1 BOARD
(See Page 53.)
JK854
AUDIO IN
JK855
MIC IN
JK853
AUDIO OUT
IC851
MIC AMP
CN851
A IN
A OUT
CN732
AUDIO INPUT SIGNAL
PB EQ
LP ON
LP
EQUALIZE AMP
REC/EE
EE
PB
REC
C2008
LPF
VR202
NORMAL PB L
IC201
MANUAL AUDIO REC/PB AMP
EE MUTE
ALC
ALC DET
PB MUTE
PB EE
LINE AMP
POWER ON/OFF MUTE
MUTING CONTROL
C2009, R2023
ATTACK RECOVERY TIME CR
R2024, R2025
ALC LEVEL
AD MUTE
TO SYSTEM CONTROL BLOCK
R2027
R2026
REC LEVEL
REC AMP
REC MUTE
PB
REC EE
POWER ON/OFF MUTE
L2001
C2014
R2043
PEAKING
RUSH CURRENT PROTECT
RIPPLE FILTER
SWD +12V
EP SW CONTROL
REC/EE CONTROL
PB/EE CONTROL
LP SW CONTROL
24H
REC H
PB H
12H
TO SYSTEM CONTROL BLOCK
VR203
24H PBL
RV204
12 H PBL
MECHANISM BLOCK
CN201
AUDIO R/P HEAD
AUDIO E HEAD
FULL E HEAD
VR201
BIAS
T2001
Q2001
70kHz OSC

3-7. TIMER BLOCK DIAGRAM

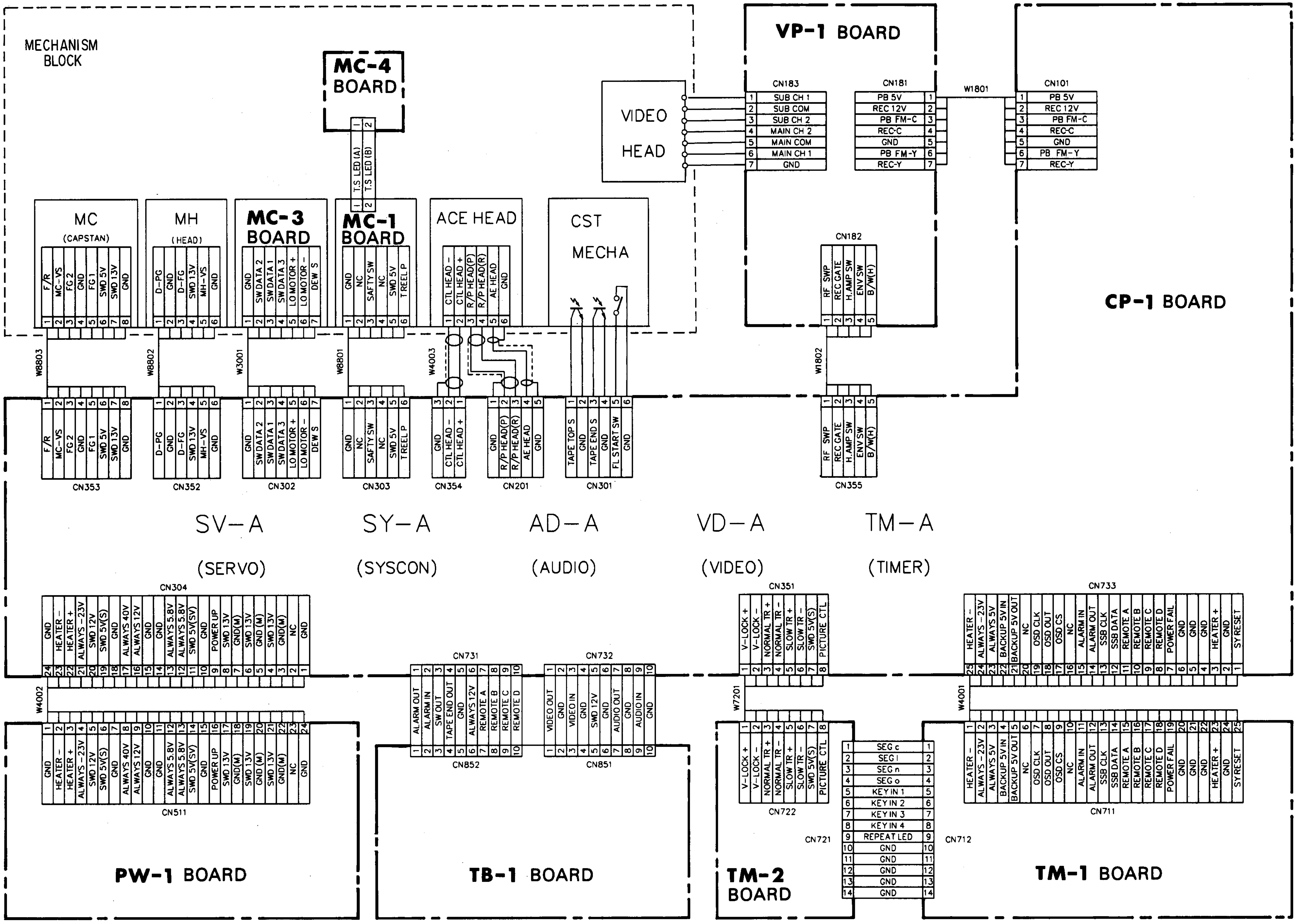

TM-1 BOARD
(See Page 58.)
A7101
FLUORESCENT DISPLAY
HEATER +
HEATER −
IC712
CHANNEL MEMORY
SCK ②
DI ③
CS ①
IC711
TIMER CPU
⑧ EAROM CLK
⑨ EAROM I/O
⑩ EAROM CS
(SSB CLK)P36 ⑰
(SSB OUT)P35
(SSB IN)P34 ⑲
SERIAL TRANSFER
CN711
23 HEATER +
1 HEATER −
TO POWER
13 SSB CLK
14 SSB I/O
TO SYSTEM CONTROL
56 P00(G1)
49 P07(G8)
48 P10(G9)
GRID OUTPUT
CLK CHECK P62 ⑤
CLOCK (32kHz)
47 P11(i)
41 P17(o)
40 P50(p)
64 P40(o)
57 P47(h)
SEGMENT AND K.SCAN OUTPUT
(OSD CLK)P24 ⑪
(OSD OUT)P23 ⑫
(OSD CS)P22 ⑬
SERIAL TRANSFER
7
9
OSD CLK
OSD OUT
OSD CS
19
17
POWER FAIL P53 ㉔
19 POWER FAIL
(TO SYSTEM CONTROL)
KEY MATRIX
S7101−S7116
K.SCAN RETURN
37 P54(KEY IN1)
34 P57(KEY IN4)
(ALARM IN)P20 ⑮
(ALARM OUT)P37 ⑯
11 ALARM IN
12 ALARM OUT
15
14
XF711 6MHz SUB OSC
㉘ X IN
㉙ X OUT
XF712 32kHz MAIN OSC
㉚ XC IN
㉛ XC OUT
① Vcc(5V)
(REMORT A)P33 ⑳
(REMORT D)P30 ㉓
15
18
REMOTE A−D
11
8
CN733
CN731
RESET ㉗
BACK UP 5V
S7117 T/D (RESET)
IC713 RESET
② ③ ①
25 SY RESET
(TO SYSTEM CONTROL)
1 − 4
CN712
Seg c, l, n, o
5 − 8
CN712
KEY IN 1
KEY IN 4
1 − 4
CN721
5 − 8
CN721
KEY MATRIX
S7201−S7206
TM-2 BOARD (See Page 60.)
CP-1 BOARD
(VIDEO BLOCK)
〔2/2〕
(See Page 39.)
IC151 (2/2)
CHARACTOR GENERATOR
② SCK
⑧ SIN
⑦ CS
HOR ㉚
VERT ㉛
HD
VD
TO VIDEO BLOCK
IC731
⑧ ⑨
⑤ ⑥
Q7302
ALARM OUT
CN731
2 ALARM IN
1 ALARM OUT
TO SYSTEM CONTROL
D8511−8534
CN852
7
10
12 TO 4 ENCODER
④ O2
⑮ O13
IN ⑳ REMOTE (TO SYSTEM CONTROL)
Vcc ⑱
ALWAYS 12V
IC852
REMOTE CONTROL DECODER
(See Page 53.)
TB-1 BOARD
(TIMER BLOCK)〔2/2〕
CP-1 BOARD
(See Page 48.)

3-8. POWER SUPPLY BLOCK DIAGRAM


PW-1 BOARD
(See Page 64.)
AC IN
F5001
L5001
D5001
D5002
T5001
POWER
TRANSFORMER
Q5001
Q5002,5003
DRIVE
Q5004
DRIVE
CONTROL
Vcc
D5003
D5013
IC511
D5105
D5104
L5103
Q5109,5110
SW
Q5102
13V
REG.
IC513
5
12V
REG.
3,4
IC512
5
12V
REG.
3,4
2
D5101
L5101
Q5101
5V
REG.
D5106
D5108
D5107
CN511
8
17
19
21
9
5
16
12
13
6
14
4
3
2
ALWAYS 40V
SWD 13V
ALWAYS 12V
SWD 12V
POWER UP
TO
SYSTEM
CONTROL
ALWAYS 5.8V
SWD 5V
ALWAYS-23V
HEATER +
HEATER −
TO
TIMER

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM


MECHANISM BLOCK
MC-4 BOARD
T.S LED (A)
T.S LED (B)
VIDEO HEAD
VP-1 BOARD
CN183
SUB CH 1
SUB COM
SUB CH 2
MAIN CH 2
MAIN COM
MAIN CH 1
GND
CN181
PB 5V
REC 12V
PB FM-C
REC-C
GND
PB FM-Y
REC-Y
W1801
CN101
CP-1 BOARD
CN182
RF SWP
REC GATE
H.AMP SW
ENV SW
B/W(H)
W1802
CN355
MC (CAPSTAN)
F/R
MC-VS
FG 2
GND
FG 1
SWD 5V
SWD 13V
GND
W8803
CN353
MH (HEAD)
D-PG
GND
D-FG
SWD 13V
MH-VS
GND
W8802
CN352
MC-3 BOARD
GND
SW DATA 2
SW DATA 1
SW DATA 3
LO MOTOR +
LO MOTOR -
DEW S
W3001
CN302
MC-1 BOARD
GND
NC
SAFTY SW
NC
SWD 5V
T REEL P
W8801
CN303
ACE HEAD
CTL HEAD -
CTL HEAD +
R/P HEAD(P)
R/P HEAD(R)
AE HEAD
GND
W4003
CN354
CN201
CST MECHA
TAPE TOP S
GND
TAPE END S
GND
FL START SW
GND
CN301
SV-A (SERVO)
SY-A (SYSCON)
AD-A (AUDIO)
VD-A (VIDEO)
TM-A (TIMER)
CN304
GND
HEATER -
HEATER +
ALWAYS -23V
SWD 12V
SWD 5V(S)
GND
ALWAYS 40V
ALWAYS 12V
GND
GND
ALWAYS 5.8V
ALWAYS 5.8V
SWD 5V(SV)
GND
POWER UP
SWD 13V
GND(M)
GND (M)
SWD 13V
GND(M)
NC
GND
W4002
CN511
PW-1 BOARD
CN731
ALARM OUT
ALARM IN
SW OUT
TAPE END OUT
GND
ALWAYS 12V
REMOTE A
REMOTE B
REMOTE C
REMOTE D
CN852
CN732
VIDEO OUT
GND
VIDEO IN
GND
SWD 12V
GND
AUDIO OUT
GND
AUDIO IN
GND
CN851
TB-1 BOARD
CN351
V-LOCK +
V-LOCK -
NORMAL TR +
NORMAL TR -
SLOW TR +
SLOW TR -
SWD 5V(S)
PICTURE CTL
W7201
CN722
CN721
TM-2 BOARD
SEG c
SEG l
SEG n
SEG o
KEY IN 1
KEY IN 2
KEY IN 3
KEY IN 4
REPEAT LED
GND
CN712
CN733
HEATER -
ALWAYS -23V
ALWAYS 5V
BACKUP 5V IN
BACKUP 5V OUT
NC
OSD CLK
OSD OUT
OSD CS
NC
ALARM IN
ALARM OUT
SSB CLK
SSB DATA
REMOTE A
REMOTE B
REMOTE C
REMOTE D
POWER FAIL
GND
GND
HEATER +
GND
SY RESET
W4001
CN711
TM-1 BOARD

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAM

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

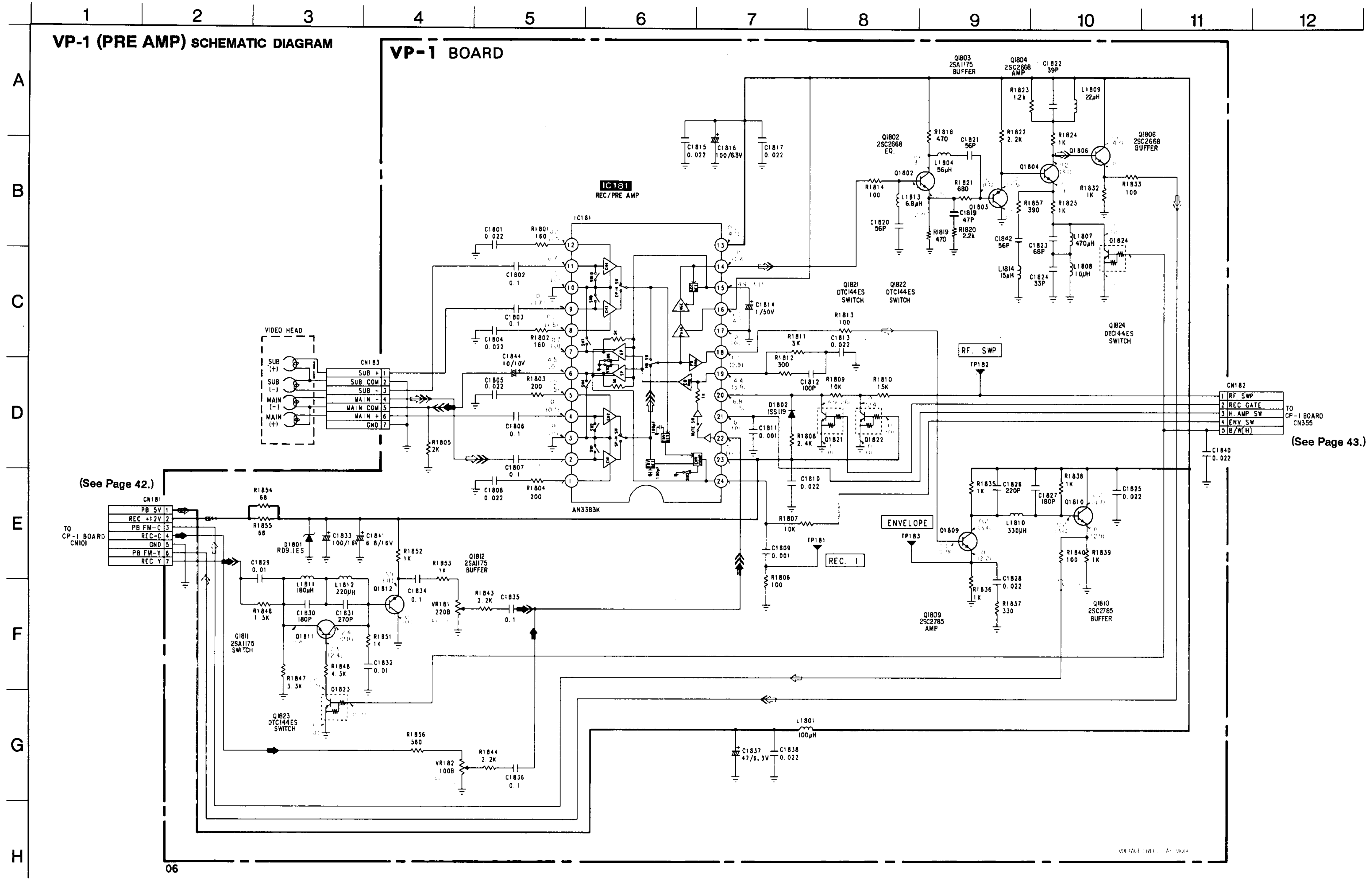
- **For printed wiring boards.**
- ○— : indicated a lead wire mounted on the component side.

- **For schematic diagrams.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minuts side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W unless otherwise noted.
  Chip resistor are 1/10W unless otherwise noted.
  kΩ : 1000Ω , MΩ : 1000kΩ .
- All capacitors are in μF unless otherwise noted. pF: μ μ F.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭ : panel designation.
- [illegible]
- [illegible] points.
- [illegible]
- [illegible]).
- [illegible]
- [illegible]).
  [illegible] production [illegible]

Note:	Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safty. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une piéce portant le numéro spéci-fié.

When indicating parts by reference number, please include the board name.

VP-1 (PRE AMP) SCHEMATIC DIAGRAM


1
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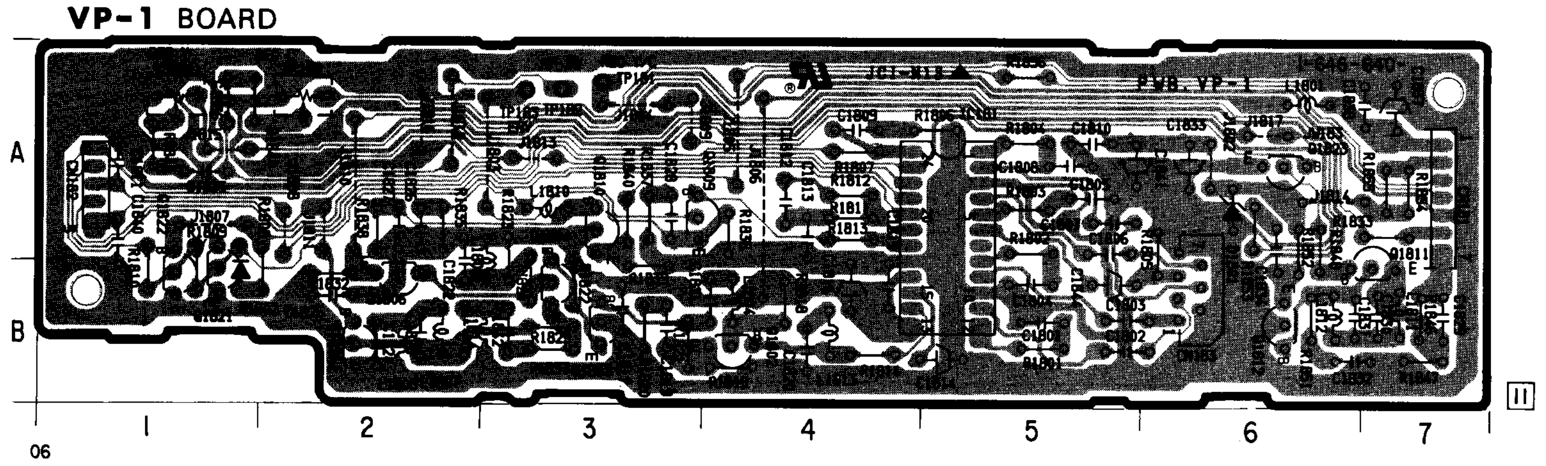
9
10
11
12
A
B
C
D
E
F
G
H
VP-1 BOARD
IC181
REC/PRE AMP
AN3383K
VIDEO HEAD
SUB (+)
SUB (-)
MAIN (-)
MAIN (+)
CN183
CN181
CN182
(See Page 42.)
(See Page 43.)
TO CP-1 BOARD CN101
TO CP-1 BOARD CN355
RF SWP
ENVELOPE
REC
Q1803 2SA1175 BUFFER
Q1804 2SC2668 AMP
Q1806 2SC2668 BUFFER
Q1802 2SC2668 EQ.
Q1821 DTC144ES SWITCH
Q1822 DTC144ES SWITCH
Q1824 DTC144ES SWITCH
Q1812 2SA1175 BUFFER
Q1811 2SA1175 SWITCH
Q1823 DTC144ES SWITCH
Q1809 2SC2785 AMP
Q1810 2SC2785 BUFFER
06

VP-1 (PRE AMP) PRINTED WIRING BOARD

VP-1 BOARD

D1801	A-6	Q1809	A-4
D1802	B-1	Q1810	A-3
		Q1811	A-7
IC181	A-5	Q1812	B-6
		Q1821	B-1
Q1802	B-4	Q1822	A-1
Q1803	B-3	Q1823	A-6
Q1804	A-3	Q1824	B-2
Q1806	B-2		


VP-1 BOARD
A
B
1
2
3
4
5
6
7
06
11

• SIGNAL PATH

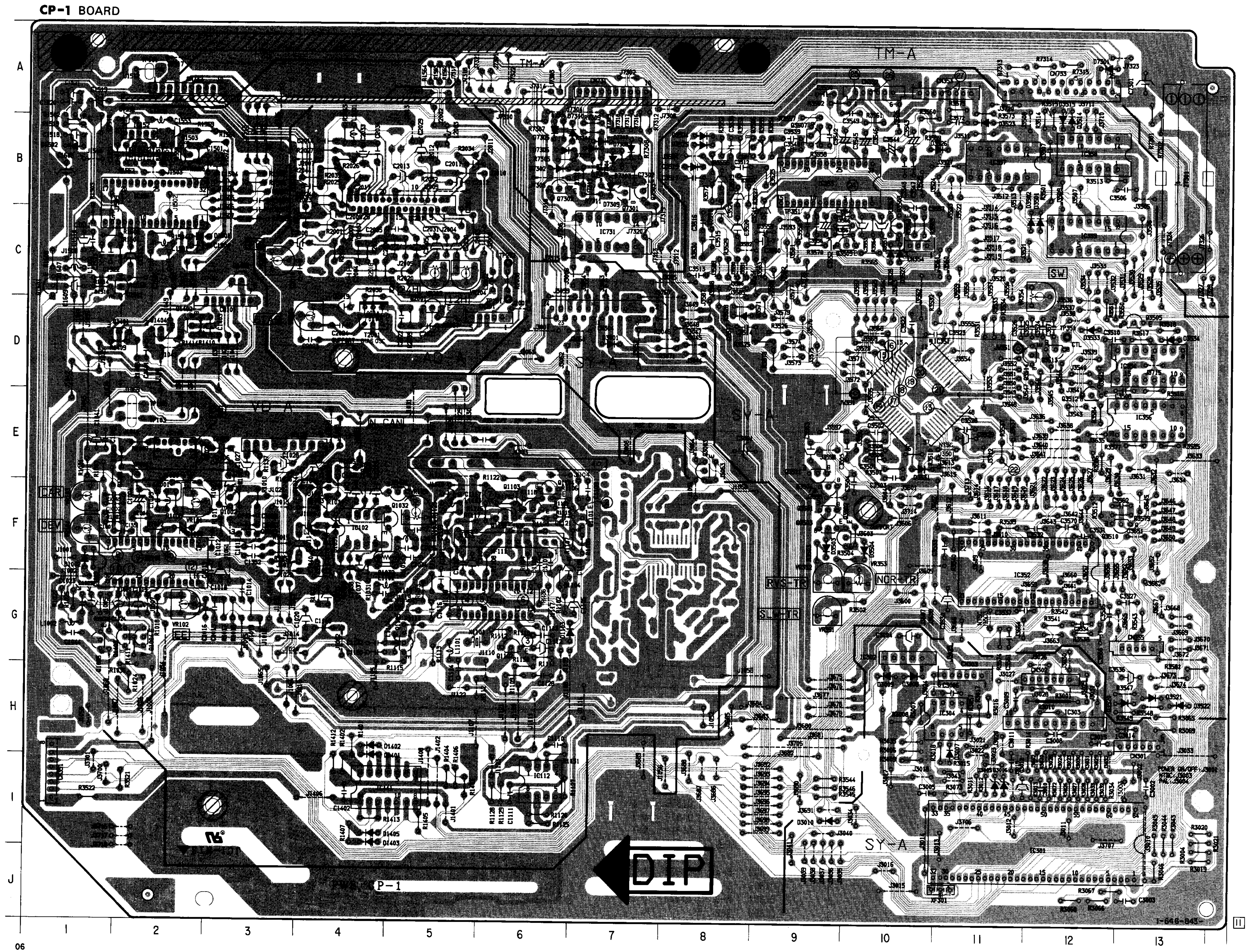
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	→	→	→	
PB	→	→	→	

CP-1 (VIDEO), (SERVO), (SYSCON), (TIMER), (AUDIO) PRINTED WIRING BOARD

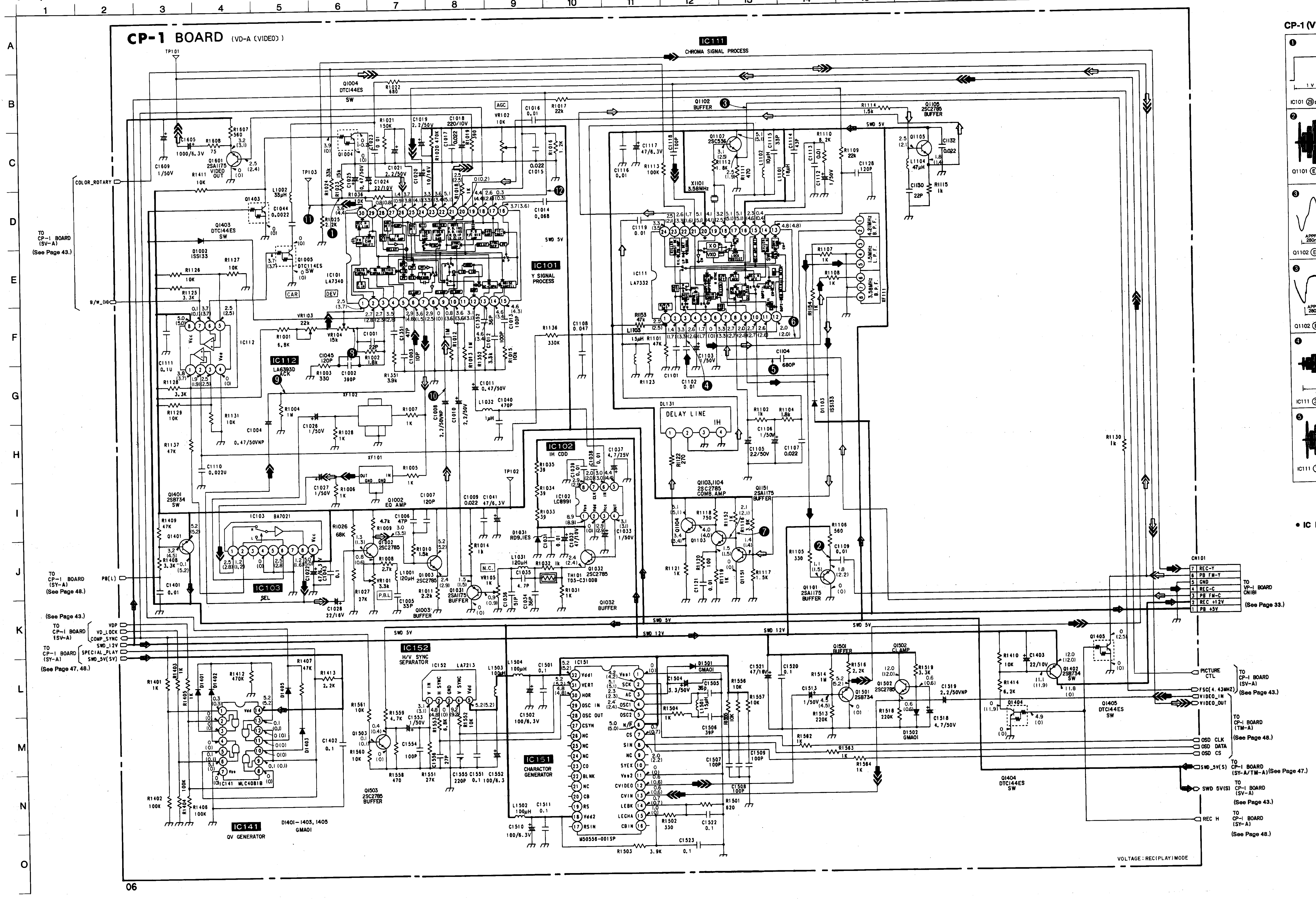
CP-1 BOARD

D1002	F-1	D3524	B-8	IC301	I-12	Q1403	G-2
D1031	F-4	D3525	B-8	IC302	G-10	Q1404	D-2
D1103	G-6	D3526	B-10	IC303	H-12	Q1405	C-3
D1401	H-5	D3527	C-10	IC304	H-11	Q1501	C-2
D1402	H-5	D3528	C-10	IC351	D-10	Q1502	B-1
D1403	I-5	D3531	E-10	IC352	F-11	Q1503	B-2
D1405	I-5	D3533	D-12	IC353	B-9	Q1601	C-1
D1501	C-3	D3534	D-13	IC354	D-12	Q2001	D-5
D1502	B-1	D7301	A-12	IC356	E-13	Q3003	E-8
D3001	D-7	D7302	B-6	IC357	B-11	Q3501	F-9
D3005	I-11	D7303	B-7	IC358	B-12	Q3502	F-9
D3006	I-11	D7304	B-7	IC359	C-12	Q3503	F-9
D3007	H-11	D7305	B-6	IC731	C-7	Q3504	F-9
D3008	H-10	D7306	B-6			Q3505	D-13
D3009	H-10	D7307	B-7	Q1002	F-3	Q3506	B-9
D3010	I-9	D7308	B-7	Q1003	F-3	Q3507	B-9
D3501	B-11	D7309	B-7	Q1004	G-3	Q3508	C-10
D3502	B-11	D7310	B-7	Q1005	H-1	Q3509	C-10
D3503	F-9			Q1031	F-5	Q3510	F-12
D3504	F-10	IC101	F-2	Q1032	F-5	Q3511	E-9
D3514	A-12	IC102	F-4	Q1101	F-7	Q3512	E-12
D3515	A-12	IC103	E-3	Q1102	G-6	Q3513	D-12
D3517	D-8	IC111	G-6	Q1103	F-6	Q3514	D-11
D3519	B-8	IC112	I-6	Q1104	F-6	Q7301	B-7
D3520	H-12	IC141	I-4	Q1105	G-5	Q7302	B-6
D3521	H-13	IC151	B-2	Q1151	F-6	Q7303	B-7
D3522	H-13	IC152	B-2	Q1401	D-2		
D3523	B-11	IC201	C-5	Q1402	D-2		

CP-1 BOARD



CP-1 (VD-A (VIDEO)) SCHEMATIC DIAGRAM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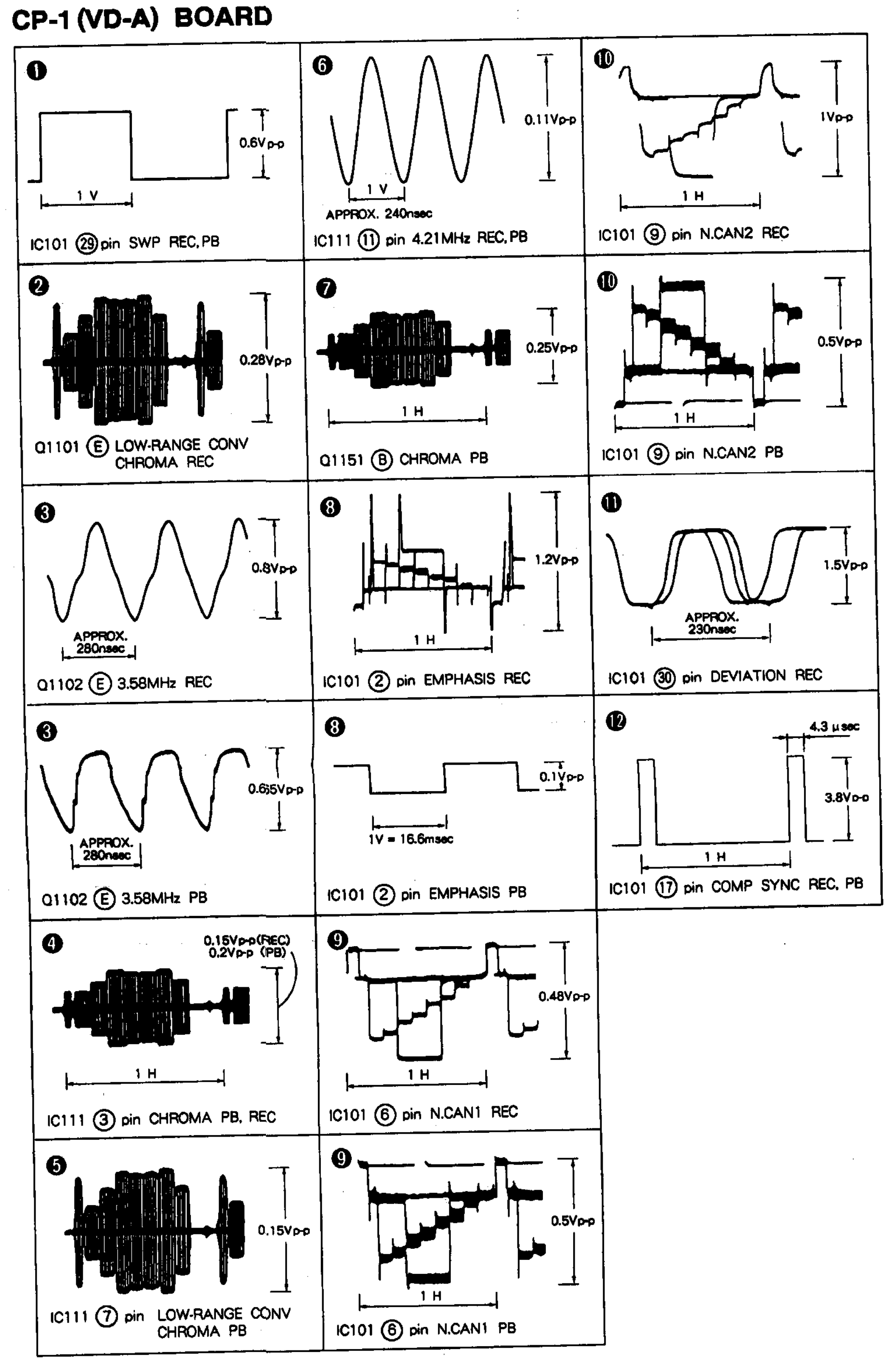
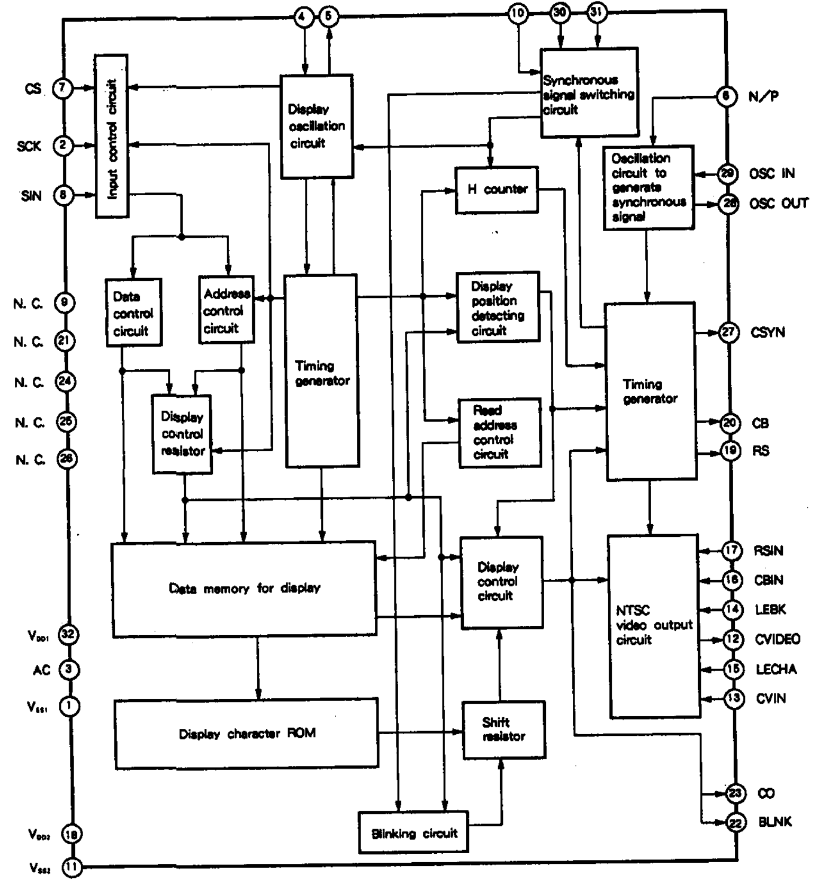
19
20
21
22
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
CP-1 BOARD (VD-A (VIDEO))
TP101
IC111
CHROMA SIGNAL PROCESS
Q1004 DTC144ES SW
Q1102 BUFFER
Q1105 2SC2785 BUFFER
Q1601 2SA1175 VIDEO OUT
Q1107 2SC536
X1101 3.58MHz
AGC
VR102 10K
COLOR_ROTARY
TO CP-1 BOARD (SV-A)
(See Page 43.)
Q1403 DTC144ES SW
D1002 1SS133
Q1005 DTC114ES SW
IC101 LA7340
CAR
DEV
IC101 Y SIGNAL PROCESS
IC111 LA7332
B/W_(H)
IC112
IC112 LA6393D
VR103 22k
VR104 15k
XF102
DL131 DELAY LINE 1H
IC102 1H CDD
IC102 LC8991
XF101
Q1002 EQ AMP
Q1401 2SB734 SW
IC103 BA7021
IC103 SEL
Q1002 2SC2785
Q1003 2SA1175 BUFFER
Q1031 2SA1175 BUFFER
D1031 RD9.1ES
TH101 TSS-C21008
Q1032 2SC2785
Q1032 BUFFER
Q1103, 1104 2SC2785 COMB. AMP
Q1151 2SA1175 BUFFER
Q1101 2SA1175 BUFFER
TO CP-1 BOARD (SY-A)
(See Page 48.)
PB(L)
(See Page 43.)
TO CP-1 BOARD (SV-A)
VDP
VD_LOCK
COMP_SYNC
SWD_12V
TO CP-1 BOARD (SY-A)
SPECIAL_PLAY
SWD_5V(SV)
(See Page 47, 48.)
SWD 5V
SWD 12V
IC152 H/V SYNC SEPARATOR
IC152 LA7213
IC151
IC151 CHARACTOR GENERATOR
M50556-001SP
Q1503 2SC2785 BUFFER
IC141 QV GENERATOR
IC141 MC14081B
D1401-1403, 1405 GMA01
D1501 GMA01
Q1501 BUFFER
Q1501 2SB734
Q1502 CLAMP
Q1502 2SC2785
D1502 GMA01
Q1404 DTC144ES SW
Q1402 2SB734 SW
Q1405 DTC144ES SW
CN101
7 REC-Y
6 PB FM-Y
5 GND
4 REC-C
3 PB FM-C
2 REC +12V
1 PB +5V
TO VP-1 BOARD CN181
(See Page 33.)
PICTURE CTL
FSC(4.43MHZ)
TO CP-1 BOARD (SV-A)
(See Page 43.)
VIDEO_IN
VIDEO_OUT
TO CP-1 BOARD (TM-A)
(See Page 48.)
OSD CLK
OSD DATA
OSD CS
SWD_5V(S)
TO CP-1 BOARD (SY-A/TM-A)
(See Page 47.)
SWD 5V(S)
TO CP-1 BOARD (SV-A)
(See Page 43.)
REC H
TO CP-1 BOARD (SY-A)
(See Page 48.)
VOLTAGE : REC(PLAY)MODE
06

CP-1 (VD-A) BOARD



• IC BLOCK DIAGRAMS

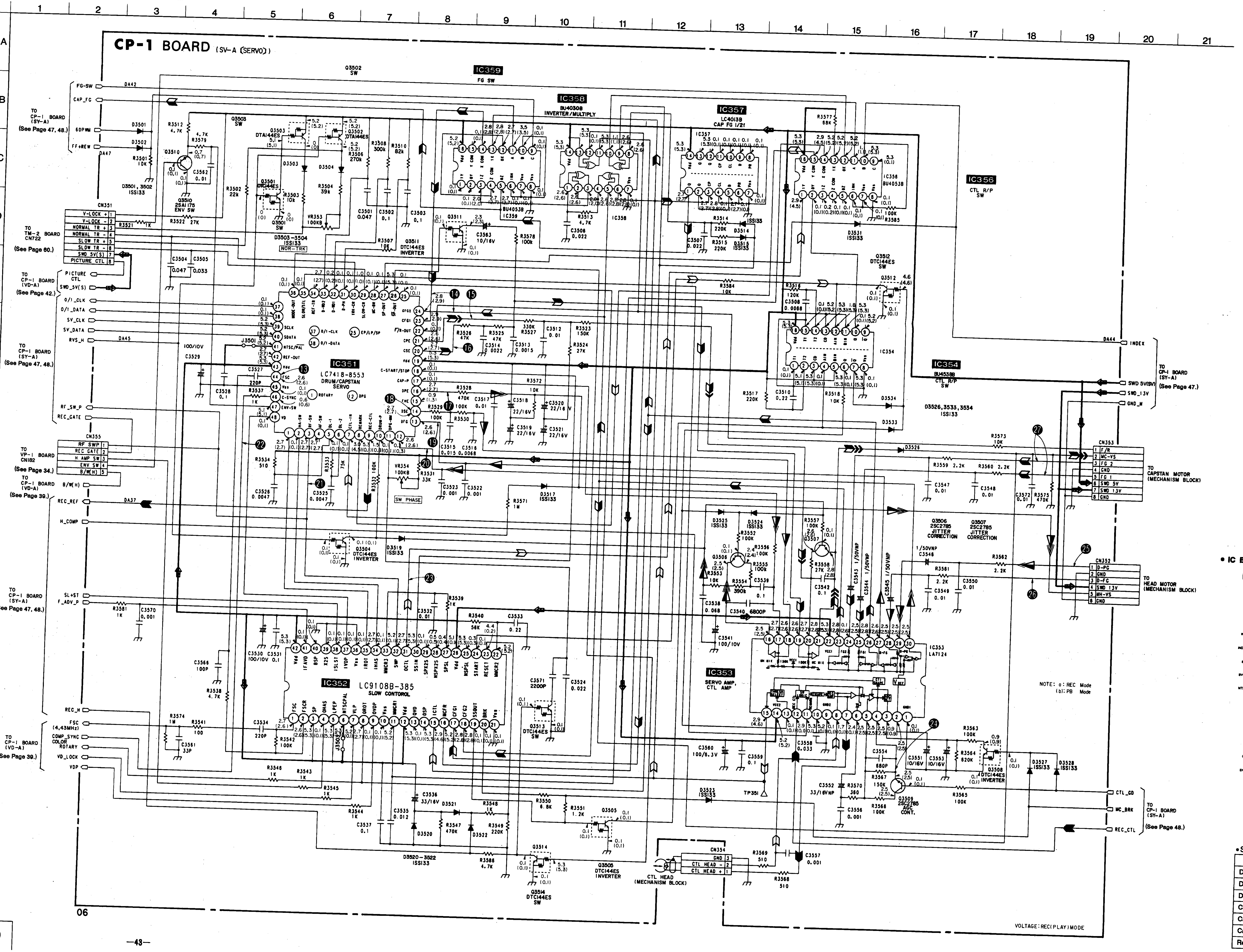
IC151 M50556-001SP


OSC1
OSC2
SYEX
HOR
VERT
CS
SCK
SIN
N. C.
N. C.
N. C.
N. C.
N. C.
VDD1
AC
VSS1
VDD2
VSS2
Input control circuit
Display oscillation circuit
Synchronous signal switching circuit
H counter
Oscillation circuit to generate synchronous signal
Data control circuit
Address control circuit
Timing generator
Display position detecting circuit
Read address control circuit
Display control resistor
Timing generator
Data memory for display
Display control circuit
NTSC video output circuit
Display character ROM
Shift resistor
Blinking circuit
N/P
OSC IN
OSC OUT
CSYN
CB
RS
RSIN
CBIN
LEBK
CVIDEO
LECHA
CVIN
CO
BLNK

•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡»	
PB	⇨	⇨»	⇨»	

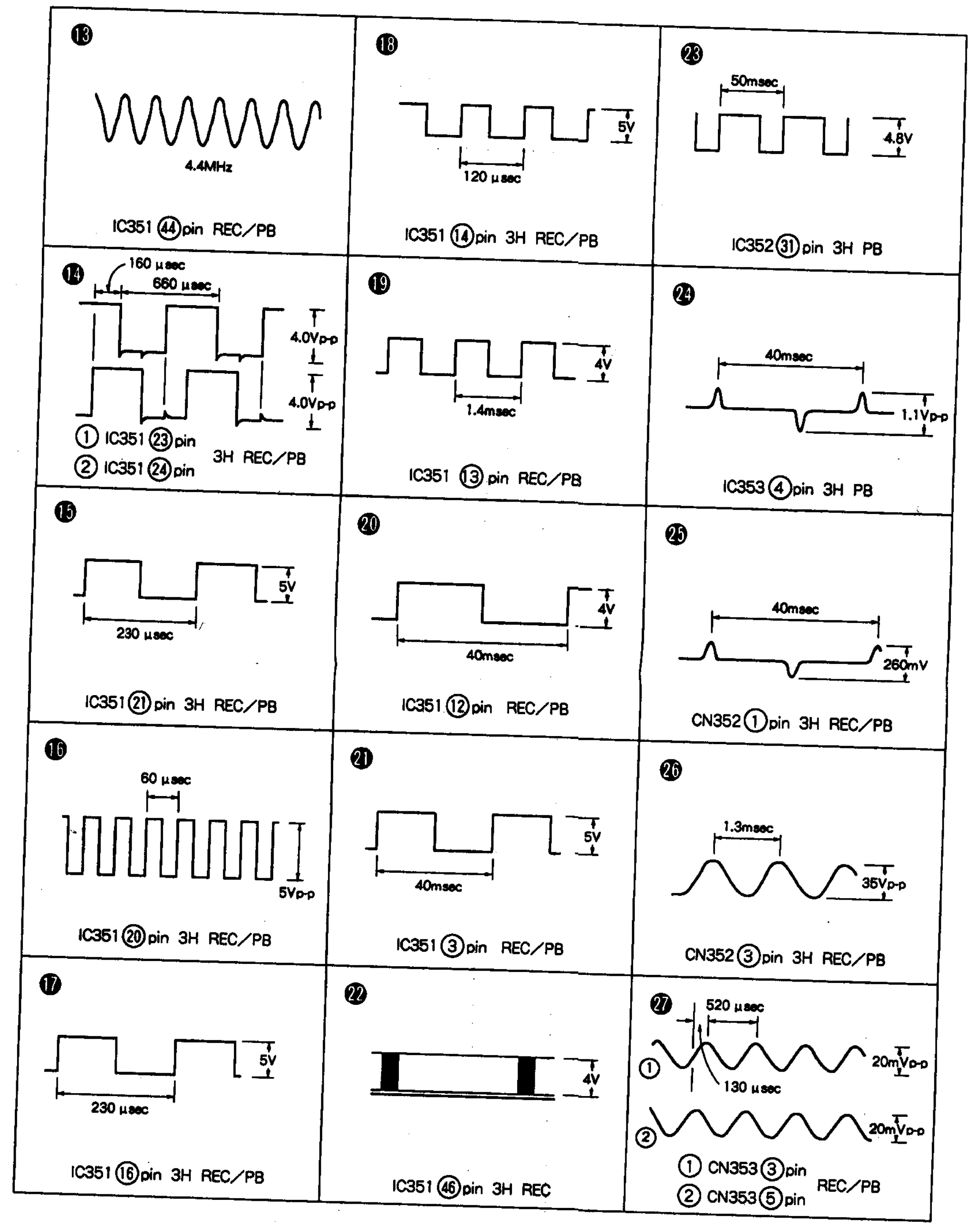
CP-1 (SV-A (SERVO)) SCHEMATIC DIAGRAM



CP-1 BOARD (SV-A (SERVO))
IC359 FG SW
IC358 BU4030B INVERTER/MULTIPLY
IC357 LC4013B CAP FG 1/2f
IC356 CTL R/P SW
IC355 BU4053B CTL R/P SW
IC354
IC351 LC7418-8553 DRUM/CAPSTAN SERVO
IC352 LC9108B-385 SLOW CONTROL
IC353 LA7124 SERVO AMP, CTL AMP
TO CP-1 BOARD (SY-A) (See Page 47, 48.)
TO TM-2 BOARD CN722 (See Page 60.)
TO CP-1 BOARD (VD-A) (See Page 42.)
TO VP-1 BOARD CN102 (See Page 34.)
TO CP-1 BOARD (VD-A) (See Page 39.)
TO CP-1 BOARD (SY-A) (See Page 47.)
TO CAPSTAN MOTOR (MECHANISM BLOCK)
TO HEAD MOTOR (MECHANISM BLOCK)
TO CP-1 BOARD (SY-A) (See Page 48.)
CTL HEAD (MECHANISM BLOCK)
NOTE: a: REC Mode (b): PB Mode
VOLTAGE: REC (PLAY) MODE
06

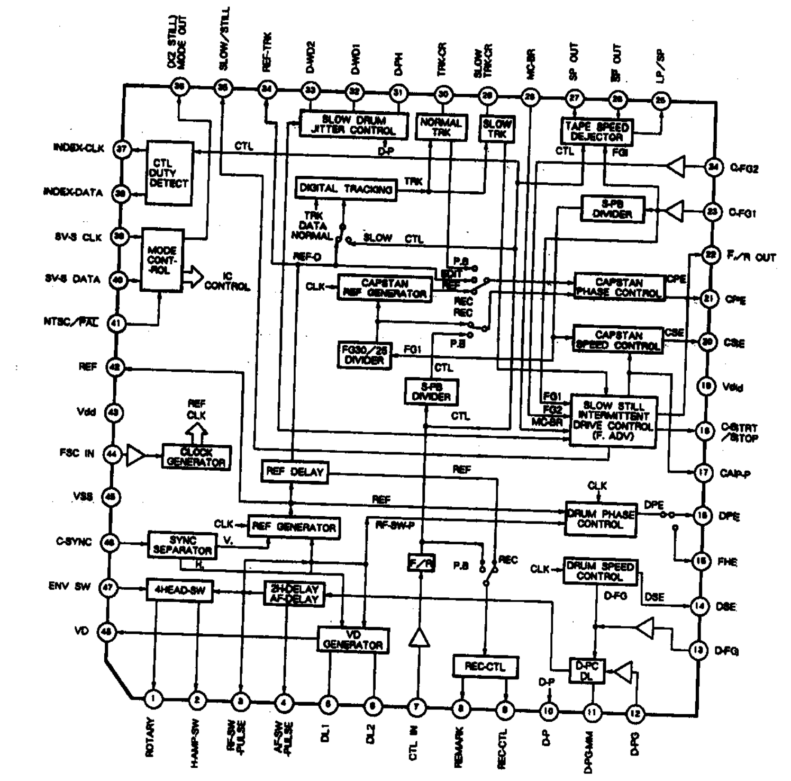
SERVO

CP-1 (SV-A) BOARD

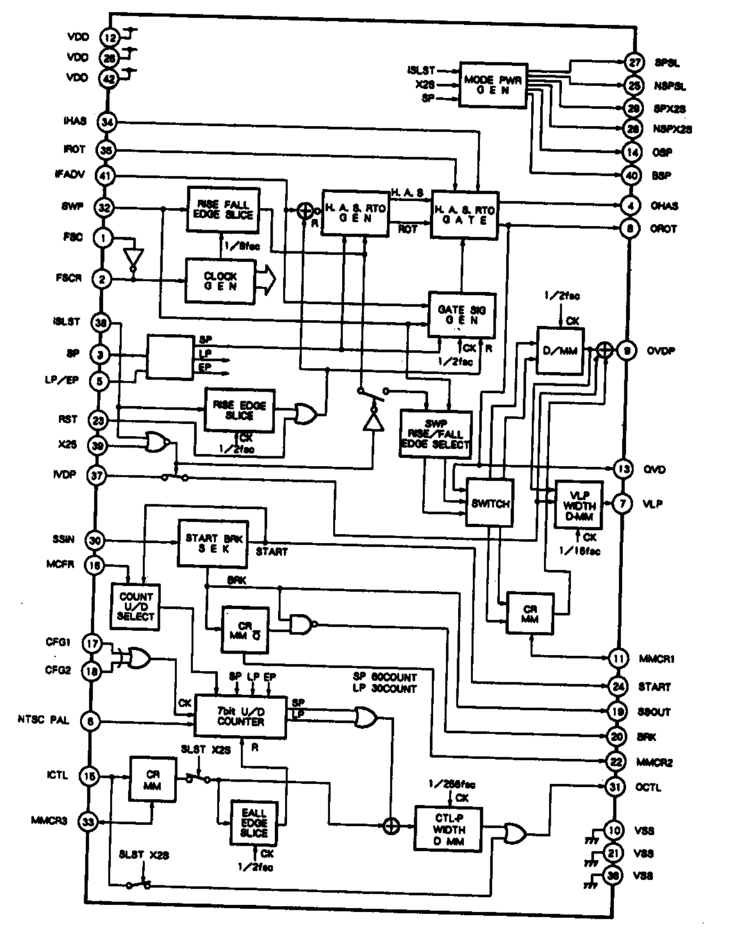


- IC BLOCK DIAGRAMS

IC351 LC7418



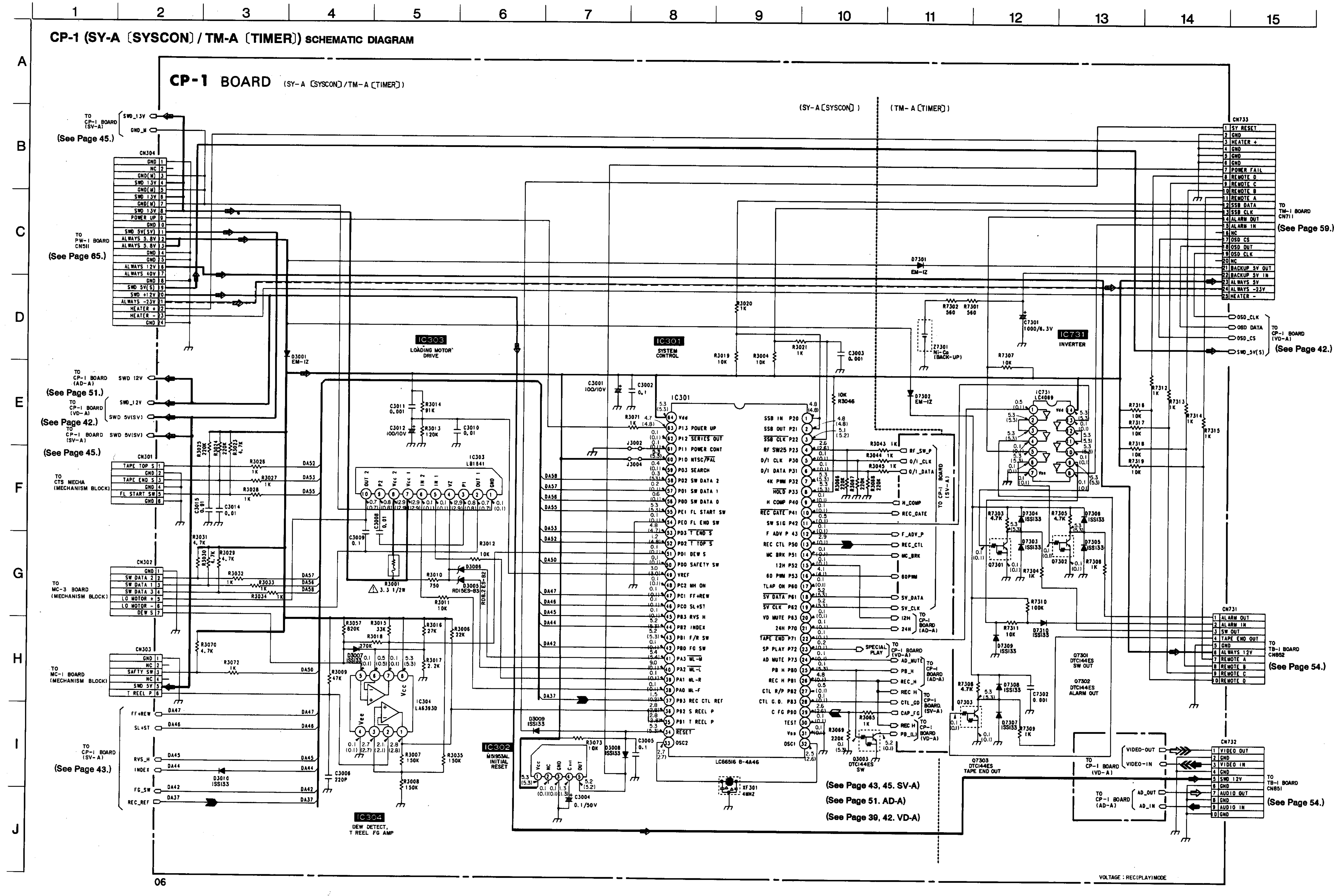
IC352 LC9108B-385



- SIGNAL PATH

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷›	
Drum servo (speed and phase)		▷››	
Capstan speed servo		➤	
Capstan phase servo		➤›	
Capstan servo (speed and phase)		➤››	
Ref. signal	➡		⇨

CP-1 (SY-A [SYSCON] / TM-A [TIMER]) SCHEMATIC DIAGRAM


CP-1 BOARD (SY-A [SYSCON]/TM-A [TIMER])
(SY-A [SYSCON]) | (TM-A [TIMER])
IC301 SYSTEM CONTROL
LC66516 B-4A46
IC303 LOADING MOTOR DRIVE
IC731 INVERTER
IC302 M51953AL INITIAL RESET
IC304 DEW DETECT, T REEL FG AMP
IC304 LA6393D
TO PW-1 BOARD CN511 (See Page 65.)
TO CP-1 BOARD (SV-A) (See Page 45.)
TO CP-1 BOARD (AD-A) (See Page 51.)
TO CP-1 BOARD (VD-A) (See Page 42.)
TO CP-1 BOARD (SV-A) (See Page 45.)
TO CTS MECHA (MECHANISM BLOCK)
TO MC-3 BOARD (MECHANISM BLOCK)
TO MC-1 BOARD (MECHANISM BLOCK)
TO CP-1 BOARD (SV-A) (See Page 43.)
TO TM-1 BOARD CN711 (See Page 59.)
TO CP-1 BOARD (VD-A) (See Page 42.)
TO TB-1 BOARD (See Page 54.)
TO TB-1 BOARD CN851 (See Page 54.)
(See Page 43, 45. SV-A)
(See Page 51. AD-A)
(See Page 39, 42. VD-A)
VOLTAGE : REC(PLAY)MODE
06

IC301 (SYSTEM CONTROL) LC66516B-4A46

Pin No.	Terminal	I/O	Description
1	SSB IN	I	Input of serial data from timer microcomputer.
2	SSB OUT	O	Output of serial data to timer microcomputer.
3	$\overline{\text{SSB CLK}}$	O	Output of clock signal for adjusting the timing of serial transfer to timer microcomputer.
4	RF SW 25	I	Input of head changeover signal used for timing of the servo circuit and detecting of rotation of drum.
5	0/1 CLK	I	Input of CTL pulse used for detecting of no-signal part of tape and 12-24H playback tracking.
6	0/1 DATA	I	CTL pulse "0" or "1" data (for VISS, VASS).
7	4k-PWM	O	Not use.
8	$\overline{\text{HOLD}}$	I	Fixed at HIGH (pull-up to 5V).
9	H COMP	O	Signal output for correction of drum rotating speed in intermittent recording.
10	$\overline{\text{REC GATE}}$	O	Signal to indicate video head recording in REC mode.
11	SW SIG	O	Pulse output every recording of one field.
12	F ADV P	O	Intermittent output of pulse synchronizing with RF SWP in each mode of STILL, F ADV, 12 – 24H REC/PLAY.
13	REC CTL	O	Output of control signal for recording.
14	MC BRK	O	Signal to indicate braking of rotation of capstan motor (MC).
15	12 H	O	"H" output in REC 2 mode 12 H RECORD and PLAY 2 mode 12 H continuous PLAYBACK.
16	60 PWM	O	Signal to switch capstan FG signal.
17	T LAP ON	O	Not use.
18	$\overline{\text{SV SDATA}}$	O	Serial output data to SV IC.
19	$\overline{\text{SV SCLK}}$	O	Serial output clock to SV IC.
20	VD MUTE	O	Not use.
21	24H	O	"H" output in REC 2 mode 24 H RECORD and PLAY 2 mode 24 H continuous PLAYBACK.

• SIGNAL PATH

	REC	REC/PB	PB
Drum speed servo			
Drum phase servo			
Drum servo (speed and phase)			
Capstan speed servo		⊳	
Capstan phase servo			
Capstan servo (speed and phase)			
Ref. signal	➧		⊳

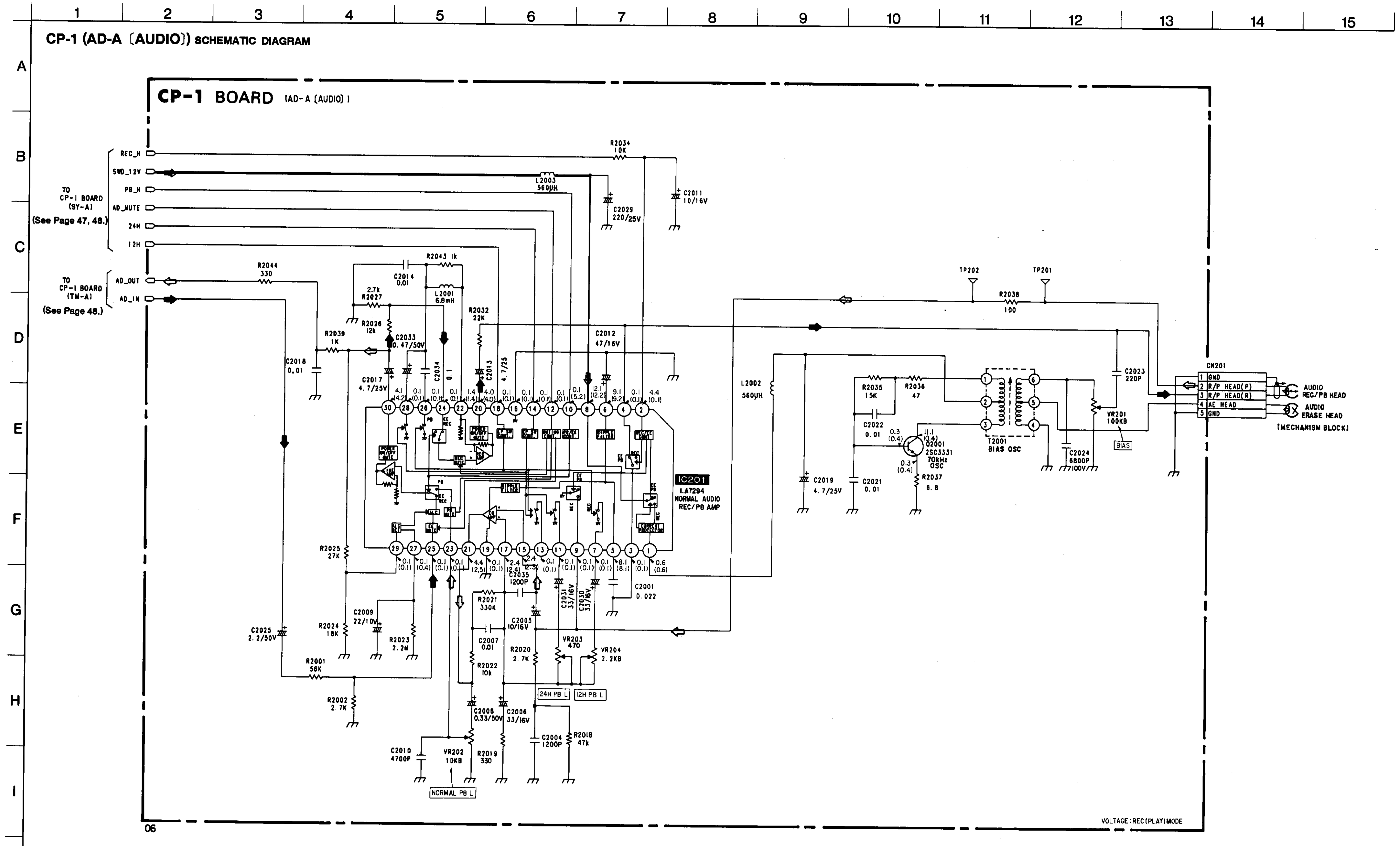
• SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡»	➡
PB			⇨»	⇨

IC301 (SYSTEM CONTROL) LC66516B-4A46 (Continued)

Pin No.	Terminal	I/O	Description
22	$\overline{\text{TAPE END}}$	O	Output when T END S input in RECORD.
23	SP PLAY	O	Output in special PLAYBACK (Back and forth SEARCH, STILL, F. ADV, PLAY 3, etc.).
24	AD MUTE	O	Signal to prohibit audio output/playback output.
25	PB H	O	Output in the mode of delivering reproduced picture.
26	REC H	O	Signal to indicate record, and output in REC mode.
27	CTL R/$\overline{\text{P}}$	O	Not use.
28	CTL G. D.	O	CTL AMP GAIN changeover signal.
29	C FG	O	Pulse of 0 – 6kHz approx. Required frequency : 1kHz.
30	TEST	I	Connected to ground.
31	Vss		Connected to ground.
32	OSC 1	I	Clock oscillation terminal.
33	OSC 2	O	Clock oscillation terminal.
34	$\overline{\text{RESET}}$	I	Reset signal input for initializing.
35	T TEEL P	I	Pulse of 0 – 500Hz approx. The rotation of TAKE reel stand changes the cycle.
36	S REEL P	I	Not use.
37	REC CTL REF	I	Pulse of 30 (or 25) Hz. Reference signal of REC CTL output in REC.
38	ML-F	O	Signal to indicate rotation of tape loading motor (ML) in normal direction.
39	ML-R	O	Signal to indicate rotation of tape loading motor (ML) in normal direction.
40	$\overline{\text{ML-L}}$	O	Signal to indicate low speed rotation of tape loading motor (ML).
41	$\overline{\text{ML-M}}$	O	Signal to indicate medium speed rotation of tape loading motor (ML).
42	FG SW	O	Capstan FG switch signal to change over frequency division.
43	F/R SW	O	Not use.
44	INDEX	O	CTL pulse changeover signal to detect VISS/VASS signal in ALARM. T/D SEARCH.
45	RVS H	O	Output of SV serial output MC-F/R as it is.
46	SL + ST	O	Output in each mode of STILL, R. STILL, PLAY 3, R-PLAY 3, F-ADV, R-F-ADV.
47	FF + REW	O	Output in FF or REW mode. (For changeover of MIX AMP GAIN).
48	MH-ON	O	Not use.
49	V REF	I	Reference voltage input for sensor comparator input.
50	SAFETY SW	I	SW to judge if the cassette is recordable or not.
51	DEW S	I	Sensor input to detect dew condensation. The input signal becomes HIGH when dew condensation is detected.
52	$\overline{\text{T TOP S}}$	I	Sensor input to detect the beginning of tape.
53	$\overline{\text{T END S}}$	I	Sensor input to detect the end of tape.
54	FL END SW	I	Connected to ground.
55	FL START SW	I	SW for front loading mechanism. (Changes when front loading starts.)
56	SW DATA 0	I	SW to indicate mechanism position.
57	SW DATA 1	I	SW to indicate mechanism position.
58	SW DATA 2	I	SW to indicate mechanism position.
59	SEARCH	O	Not use.
60	NTSC/$\overline{\text{PAL}}$	I	For changeover of NTSC/PAL.
61	POWER CONT	I	For changeover of POWER ON/OFF.
62	$\overline{\text{SERIES OUT}}$	O	Not use.
63	POWER UP	O	Output except for POWER OFF mode.
64	Vdd		5V power supply terminal.

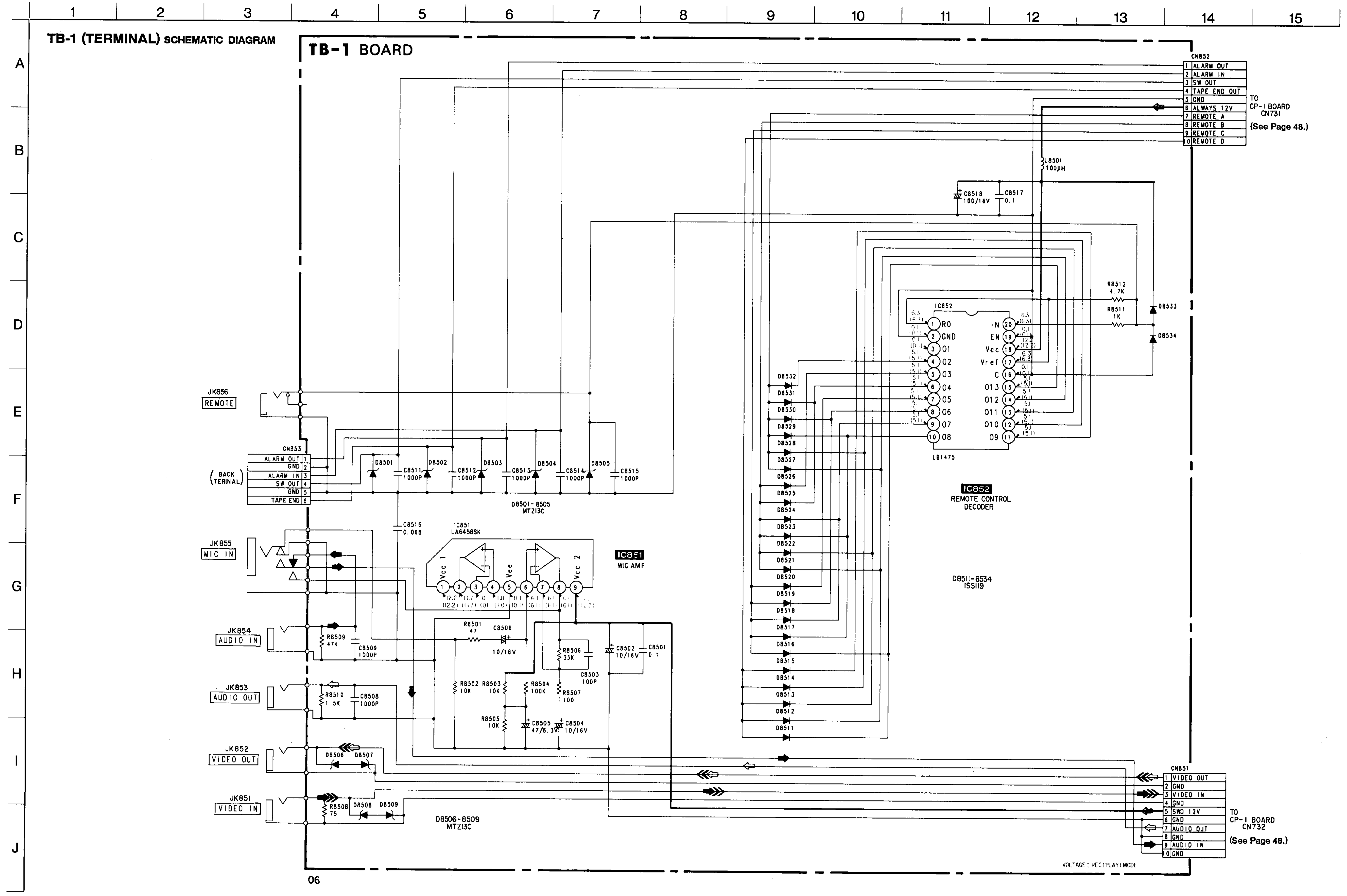
CP-1 (AD-A 〔AUDIO〕) SCHEMATIC DIAGRAM


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
A B C D E F G H I J
CP-1 BOARD (AD-A (AUDIO))
TO CP-1 BOARD (SY-A)
(See Page 47, 48.)
REC_H
SWD_12V
PB_H
AD_MUTE
24H
12H
TO CP-1 BOARD (TM-A)
(See Page 48.)
AD_OUT
AD_IN
IC201
LA7294
NORMAL AUDIO REC/PB AMP
L2003 560μH
C2029 220/25V
C2011 10/16V
R2034 10K
L2001 6.8mH
L2002 560μH
Q2001 2SC3331 70kHz OSC
T2001 BIAS OSC
R2038 100
TP202
TP201
C2023 220P
C2024 6800P 100V
VR201 100KB
BIAS
CN201
1 GND
2 R/P HEAD(P)
3 R/P HEAD(R)
4 AE HEAD
5 GND
AUDIO REC/PB HEAD
AUDIO ERASE HEAD
(MECHANISM BLOCK)
24H PB L
12H PB L
NORMAL PB L
VR202 10KB
VR203 470
VR204 2.2KB
06
VOLTAGE : REC (PLAY) MODE

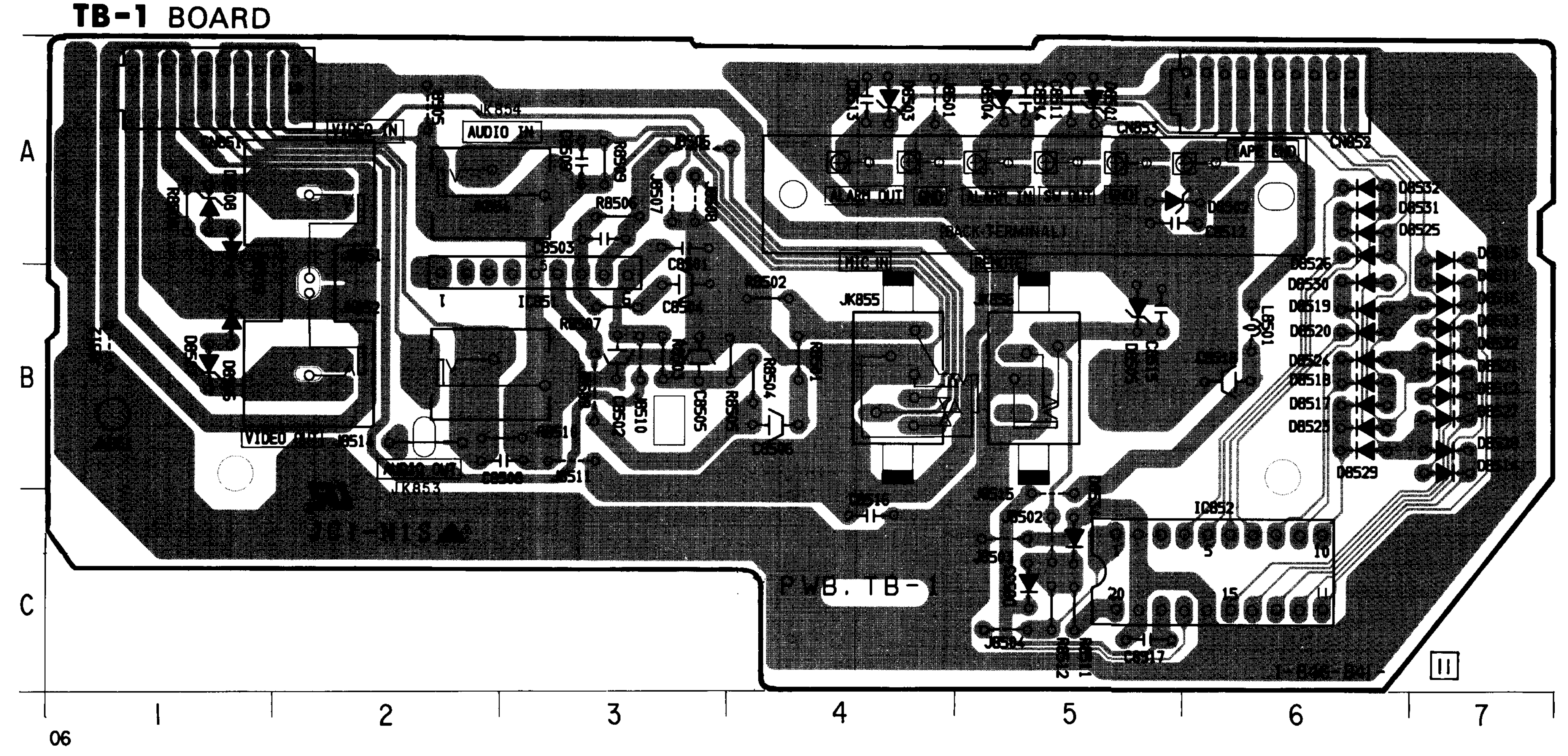
• SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				➡
PB				⇨

TB-1 (TERMINAL) SCHEMATIC DIAGRAM


TB-1 BOARD
CN852
1 ALARM OUT
2 ALARM IN
3 SW OUT
4 TAPE END OUT
5 GND
6 ALWAYS 12V
7 REMOTE A
8 REMOTE B
9 REMOTE C
10 REMOTE D
TO CP-1 BOARD CN731
(See Page 48.)
L8501 100µH
C8518 100/16V
C8517 0.1
R8512 4.7K
R8511 1K
D8533
D8534
IC852
RO
GND
O1
O2
O3
O4
O5
O6
O7
O8
IN
EN
Vcc
Vref
C
O13
O12
O11
O10
O9
LB1475
IC852 REMOTE CONTROL DECODER
D8511-8534 ISS119
JK856 REMOTE
CN853
ALARM OUT 1
GND 2
ALARM IN 3
SW OUT 4
GND 5
TAPE END 6
(BACK TERINAL)
D8501 D8502 D8503 D8504 D8505
C8511 1000P C8512 1000P C8513 1000P C8514 1000P C8515 1000P
D8501-8505 MTZ13C
C8516 0.068
IC851 LA6458SK
IC851 MIC AMF
JK855 MIC IN
JK854 AUDIO IN
R8509 47K
C8509 1000P
JK853 AUDIO OUT
R8510 1.5K
C8508 1000P
R8501 47
C8506 10/16V
R8502 10K R8503 10K R8504 100K
R8505 10K
C8505 47/6.3V
C8504 10/16V
R8506 33K
C8503 100P
R8507 100
C8502 10/16V
C8501 0.1
JK852 VIDEO OUT
D8506 D8507
JK851 VIDEO IN
R8508 75
D8508 D8509
D8506-8509 MTZ13C
CN851
1 VIDEO OUT
2 GND
3 VIDEO IN
4 GND
5 SWD 12V
6 GND
7 AUDIO OUT
8 GND
9 AUDIO IN
10 GND
TO CP-1 BOARD CN732
(See Page 48.)
VOLTAGE ; REC(PLAY) MODE
06

TB-1 (TERMINAL) PRINTED WIRING BOARD


TB-1 BOARD
VIDEO IN
AUDIO IN
JK854
CN851
IC851
JK855
JK856
MIC IN
REMOTE
ALARM OUT
GND
ALARM IN
SW OUT
TAPE END
BACK TERMINAL
CN853
CN852
D8532 D8531 D8525 D8526 D8530 D8519 D8520 D8524 D8518 D8517 D8523 D8529
L8501
IC852
VIDEO OUT
JK851
AUDIO OUT
JK853
PWB. TB-1
A
B
C
1 2 3 4 5 6 7
06

• SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡»	➡
PB			⇨»	⇨

TB-1 BOARD

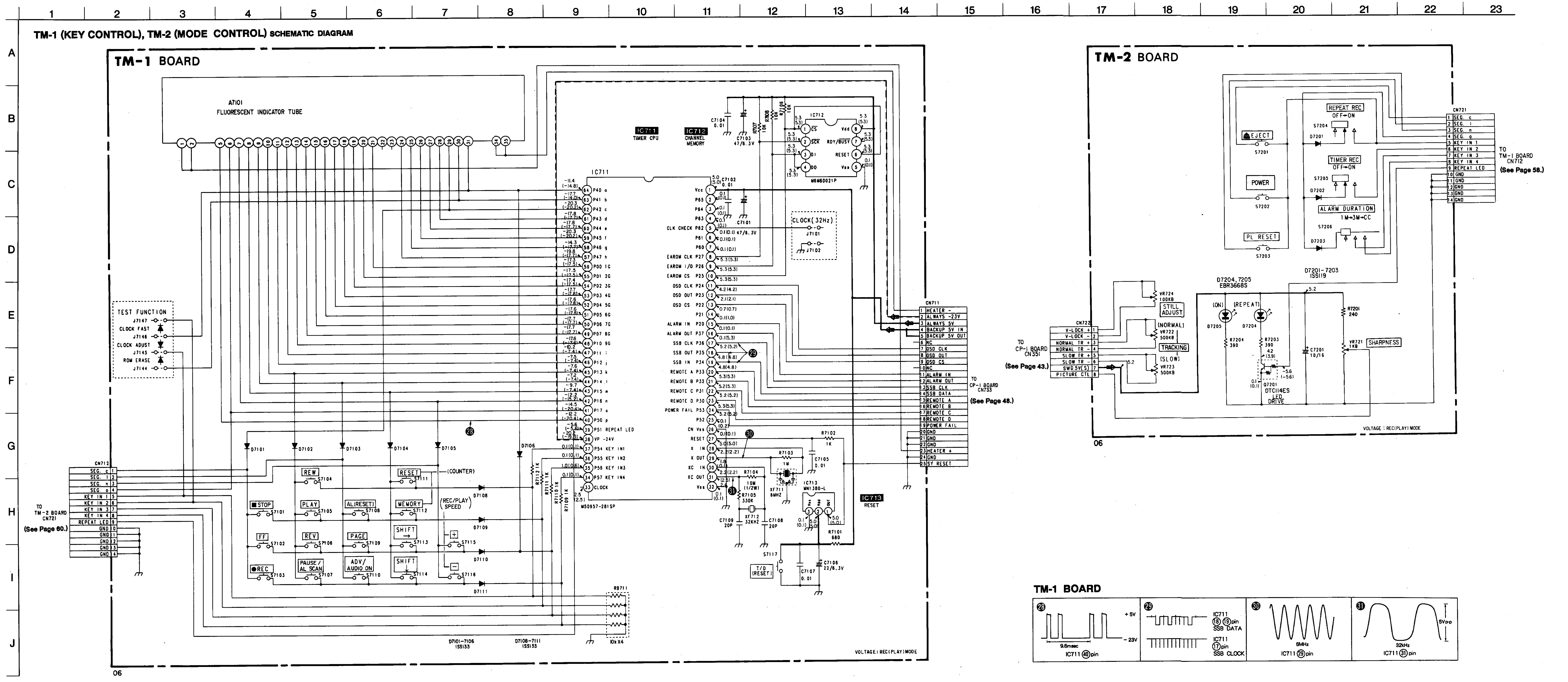
D8501	A-5	D8514	B-7	D8526	A-6
D8502	A-6	D8515	A-7	D8527	B-7
D8503	A-4	D8516	B-7	D8528	B-7
D8504	A-5	D8517	B-6	D8529	B-6
D8505	B-5	D8518	B-6	D8530	B-6
D8506	A-1	D8519	B-6	D8531	A-7
D8507	A-1	D8520	B-6	D8532	A-7
D8508	A-1	D8521	B-7	D8533	C-5
D8509	A-1	D8522	B-7	D8534	B-5
D8511	B-7	D8523	B-6		
D8512	B-7	D8524	B-6	IC851	B-3
D8513	B-7	D8525	A-7	IC852	C-6

IC711 (TIMER CPU) M50957-281SP

Pin No.	Terminal	Description	ACTIV	I/O
1	Vcc	5V		
2	N. C.	Not use.		
3	N. C.	Not use.		
4	N. C.	Not use.		
5	CLK CHECK	CLOCK 32Hz	L	O
6	N. C.	Not use.		
7	N. C.	Not use.		
8	E²PROM CLK	Clock output to E²PROM	L	O
9	E²PROM I/O	Data input/output to E²PROM	L	I/O
10	E²PROM CS	CS output to E²PROM	L	O
11	OSD CLK	Clock output to OSD	L	O
12	OSD OUT	Data output to OSD	L	O
13	OSD CS	CS output to OSD	L	O
14	N. C.	Not use.	H	I
15	ALARM IN		H	I
16	ALARM OUT		H	O
17	SSB S. CLK	SSB CLK input	L	I
18	SSB S. OUT	SSB DATA output	L	O
19	SSB S. IN	SSB DATA input	L	I
20	REMOTE A			I
21	REMOTE B		L	I
22	REMOTE C		L	I
23	REMOTE D		L	I
24	POWER FAIL	Power failure detection	L	I
25	N. C.	Not use.		
26	CNVss	GND		
27	RESET	Reset input	L	I
28	X_{IN}	6.29MHz		
29	X_{OUT}			
30	X_{CI}	32.768MHz		
31	X_{CO}			
32	Xss	GND		
33	CLOCK	Not use.		
34 ≀ 37	KEY IN	KEY SCAN input	H	I
38	Vp	− 24V		
39	REPEAT		H	O
40	p SEG ≀ i SEG	SEGMENT/KEY SCAN output	H	O
41 ≀ 47				O
48	1~9 GRID	GRID output	H	O
49 ≀ 56				
57 ≀ 64	a SEG ≀ h SEG	SEGMENT/KEY SCAN output	H	O

KEY CONTROL, MODE CONTROL

TM-1 (KEY CONTROL), TM-2 (MODE CONTROL) SCHEMATIC DIAGRAM

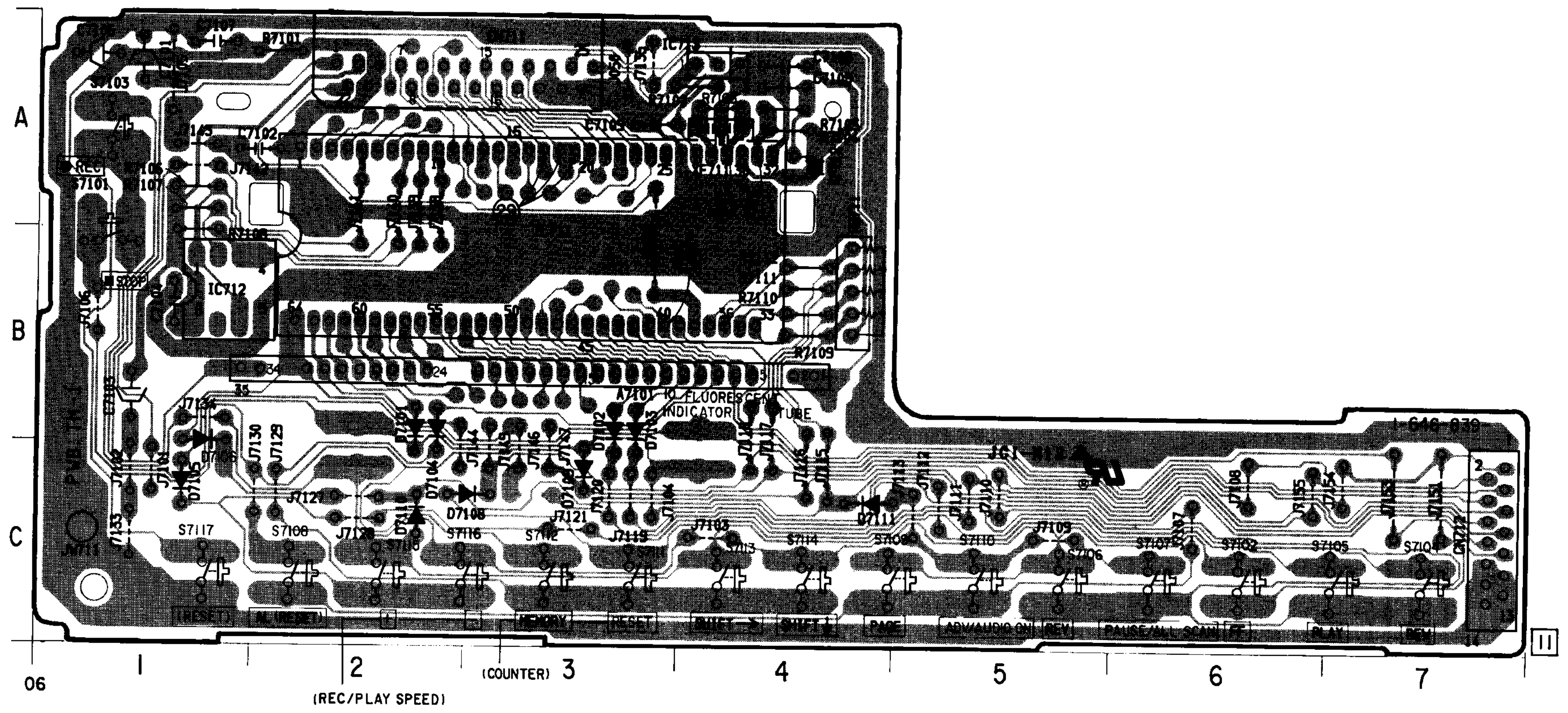

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
A
B
C
D
E
F
G
H
I
J
TM-1 BOARD
A7101
FLUORESCENT INDICATOR TUBE
IC711
TIMER CPU
IC712
CHANNEL MEMORY
IC713
RESET
M50957-281SP
M6M80021P
CLOCK(32Hz)
J7101
J7102
TEST FUNCTION
J7147
CLOCK FAST
J7146
CLOCK ADJUST
J7145
ROM ERASE
J7144
CN712
SEG. c
SEG. i
SEG. n
SEG. o
KEY IN 1
KEY IN 2
KEY IN 3
KEY IN 4
REPEAT LED
GND
TO
TM-2 BOARD
CN721
(See Page 60.)
D7101
D7102
D7103
D7104
D7105
D7106
D7108
D7109
D7110
D7111
■STOP
S7101
FF
S7102
●REC
S7103
REW
S7104
PLAY
S7105
REV
S7106
PAUSE / AL SCAN
S7107
AL(RESET)
S7108
PAGE
S7109
ADV/ AUDIO ON
S7110
RESET
S7111
(COUNTER)
MEMORY
S7112
SHIFT →
S7113
SHIFT ↓
S7114
(REC/PLAY SPEED)
+
S7115
−
S7116
R7109 1K
R7110 1K
R7111 1K
R7112 1K
D7101–7106
1SS133
D7108–7111
1SS133
X7101
6MHz
X7102
32KHz
C7108
C7109
C7105
C7106
C7107
S7117
T/S (RESET)
CN711
HEATER −
ALWAYS −23V
ALWAYS 5V
BACKUP 5V IN
BACKUP 5V OUT
NC
OSD CLK
OSD OUT
OSD CS
NC
ALARM IN
ALARM OUT
SSB CLK
SSB DATA
REMOTE A
REMOTE B
REMOTE C
REMOTE D
POWER FAIL
GND
GND
GND
HEATER +
GND
SY RESET
TO
CP-1 BOARD
CN733
(See Page 48.)
VOLTAGE : REC(PLAY) MODE
06
TM-2 BOARD
REPEAT REC
OFF→ON
S7204
D7201
EJECT
S7201
TIMER REC
OFF→ON
S7205
D7202
POWER
S7202
ALARM DURATION
1M→3M→CC
S7206
D7203
PL RESET
S7203
CN721
SEG. c
SEG. i
SEG. n
SEG. o
KEY IN 1
KEY IN 2
KEY IN 3
KEY IN 4
REPEAT LED
GND
TO
TM-1 BOARD
CN712
(See Page 58.)
D7201–7203
1SS119
D7204, 7205
EBR3668S
CN722
V-LOCK +
V-LOCK −
NORMAL TR +
NORMAL TR −
SLOW TR +
SLOW TR −
SWD 5V(S)
PICTURE CTL
TO
CP-1 BOARD
CN351
(See Page 43.)
VR724
100KB
STILL ADJUST
(NORMAL)
VR722
500KB
TRACKING
(SLOW)
VR723
500KB
(ON)
D7205
(REPEAT)
D7204
R7204
390
R7203
390
Q7201
DTC114ES
LED DRIVE
C7201
10/16
R7201
240
VR721
1KB
SHARPNESS
VOLTAGE : REC(PLAY) MODE
06
TM-1 BOARD
㉘
+5V
−23V
9.6msec
IC711 ㊵pin
㉙
IC711
⑱ ⑲pin
SSB DATA
IC711
⑰pin
SSB CLOCK
㉚
6MHz
IC711 ㉙pin
㉛
5Vp-p
32kHz
IC711 ㉛pin

TM-1 (KEY CONTROL), TM-2 (MODE CONTROL) PRINTED WIRING BOARD

TM-1 BOARD

D7101	B-2
D7102	B-3
D7103	B-3
D7104	C-2
D7105	C-1
D7106	C-1
D7108	C-3
D7109	C-3
D7110	C-2
D7111	C-4
IC711	B-3
IC712	B-1
IC713	A-4

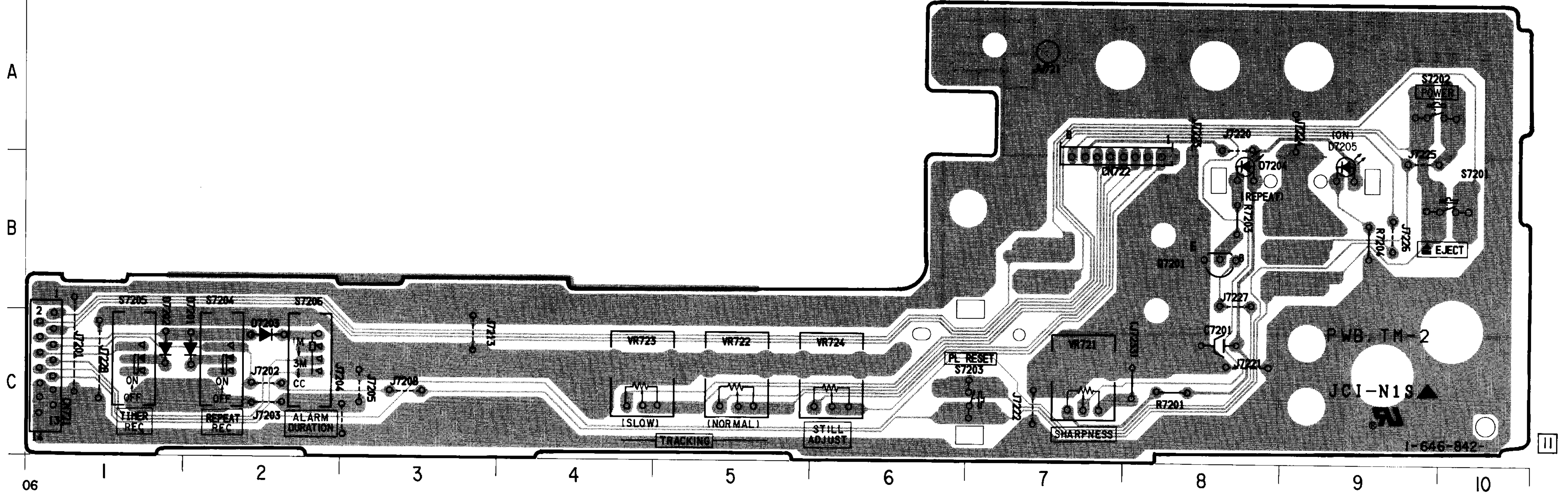
TM-1 BOARD


A
B
C
06
1
2
(REC/PLAY SPEED)
(COUNTER)
3
4
5
6
7
PWB, TM-1
IC712
IC713
D7105
D7106
D7104
D7108
D7111
J7134
J7130
J7129
J7127
J7128
J7121
J7119
J7103
J7109
R7109
IC 711 FLUORESCENT INDICATOR TUBE
JCI
1-646-839
S7117
S7108
S7118
S7116
S7112
S7111
S7113
S7114
S7109
S7110
S7106
S7107
S7102
S7105
S7104
RESET
AL RESET
MEMORY
RESET
QUIET →
SHIFT
PAGE
ADV/AUDIO ON
REV
PAUSE/ALL SCAN
FF
PLAY
REW
II

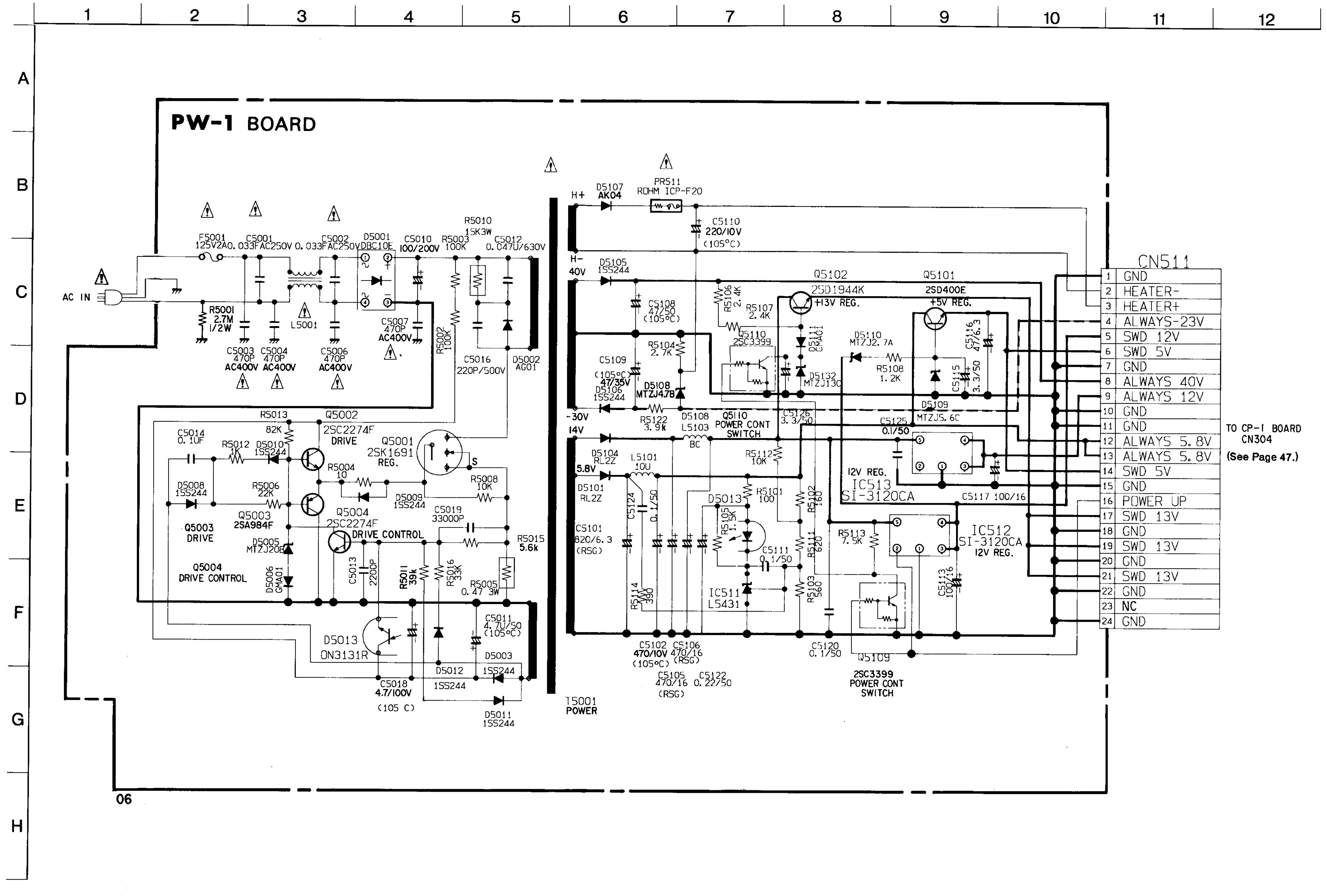
TM-2 BOARD

D7201	B-2
D7202	B-1
D7203	C-2
D7204	B-8
D7205	A-9
Q7201	B-8

TM-2 BOARD

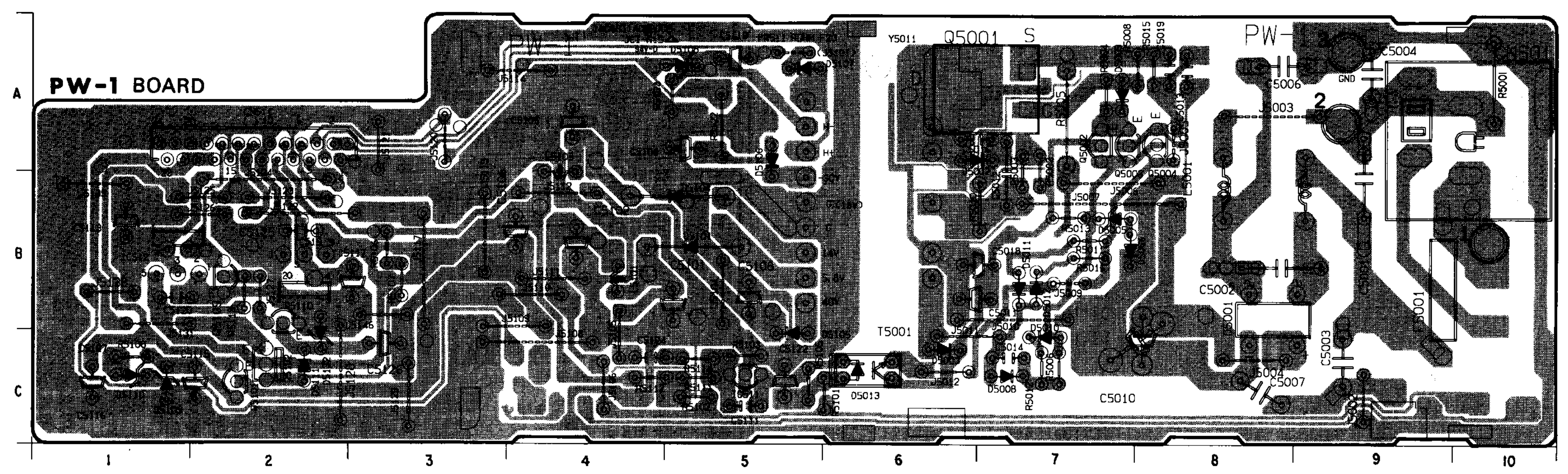

A
B
C
06
1
2
3
4
5
6
7
8
9
10
J7201
J7228
S7205
D7202
D7201
S7204
D7203
S7206
1M
3M
CC
ON
OFF
TIMER REC
REPEAT REC
ALARM DURATION
J7202
J7203
J7204
J7205
J7208
J7213
VR723
VR722
VR724
(SLOW)
(NORMAL)
TRACKING
STILL ADJUST
PL RESET
S7203
J7222
VR721
SHARPNESS
R7201
CN722
J7220
(ON)
D7205
D7204
(REPEAT)
R7203
Q7201
J7227
C7201
J7221
S7202
POWER
J7225
S7201
R7204
J7226
EJECT
PWB, TM-2
JCI-N1S
1-646-842-
II

PW-1 (POWER SUPPLY) SCHEMATIC DIAGRAM


PW-1 BOARD
AC IN
F5001 125V2A
C5001 0.033F AC250V
C5002 0.033F AC250V
D5001 D3C10E
C5010 100/200V
R5003 100K
R5010 15K3W
C5012 0.047U/630V
R5001 2.7M 1/2W
C5003 470P AC400V
C5004 470P AC400V
C5006 470P AC400V
L5001
C5007 470P AC400V
R5002 100K
C5016 220P/500V
D5002 A601
R5013 82K
Q5002 2SC2274F DRIVE
Q5001 2SK1691 REG.
C5014 0.1UF
R5012 2K
D5010 1SS244
R5004 10
R5008 10K
D5008 1SS244
R5006 22K
Q5003 2SA984F
D5009 1SS244
C5019 33000P
Q5003 DRIVE
Q5004 2SC2274F DRIVE CONTROL
Q5004 DRIVE CONTROL
D5005 MTZJ20B
R5015 5.6k
D5006 DAN401
C5013 2200P
R5011 39k
R5016 33K
R5005 0.47 3W
D5013 ON3131R
C5011 4.7U/50 (105°C)
D5012 1SS244
D5003 1SS244
C5018 4.7/100V (105 C)
D5011 1SS244
T5001 POWER
06
H+
D5107 AK04
PR511 ROHM ICP-F20
C5110 220/10V (105°C)
H-
40V
D5105 1SS244
C5108 22/50 (105°C)
R5106 2.4K
Q5102 2SD1944K +13V REG.
Q5101 2SD400E +5V REG.
R5107 2.4K
C5109 (105°C) 47/35V
R5104 2.7K
Q5110 2SC3399
D5111
D5110 MTZJ2.7A
C5115 47/6.3
D5106 1SS244
D5108 MTZJ47B
D5132 MTZJ13C
R5108 1.2K
C5116 3.3/50
-30V
14V
R5122 3.9k
D5108
L5103 BC
Q5110 POWER CONT SWITCH
C5126 3.3/50
C5125 0.1/50
D5109 MTZJ5.6C
5.8V
D5104 RL2Z
L5101 10U
R5112 10K
12V REG.
IC513 SI-3120CA
C5117 100/16
D5101 RL2Z
D5013
R5101 100
IC512 SI-3120CA 12V REG.
C5101 820/6.3 (RSG)
R5102 160
R5113 7.5K
C5111 0.1/50
R5114 390
IC511 L5431
R5111 620
R5103 620
C5113 100/16
C5102 470/10V (105°C)
C5106 470/16 (RSG)
C5105 470/16 (RSG)
C5122 0.22/50
C5120 0.1/50
Q5109 2SC3399 POWER CONT SWITCH
CN511
1 GND
2 HEATER-
3 HEATER+
4 ALWAYS-23V
5 SWD 12V
6 SWD 5V
7 GND
8 ALWAYS 40V
9 ALWAYS 12V
10 GND
11 GND
12 ALWAYS 5.8V
13 ALWAYS 5.8V
14 SWD 5V
15 GND
16 POWER UP
17 SWD 13V
18 GND
19 SWD 13V
20 GND
21 SWD 13V
22 GND
23 NC
24 GND
TO CP-I BOARD CN304
(See Page 47.)
1 2 3 4 5 6 7 8 9 10 11 12
A B C D E F G H

POWER SUPPLY

PW-1 (POWER SUPPLY) PRINTED WIRING BOARD

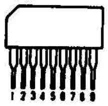

PW-1 BOARD
PW-
Q5001
T5001
C5010
C5002
C5007
A
B
C
1 2 3 4 5 6 7 8 9 10

PW-1 BOARD

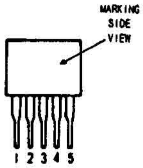
D5001	A-8	D5104	B-5	IC513	B-2
D5002	A-6	D5105	C-5		
D5003	C-6	D5106	B-5	Q5001	A-6
D5005	B-7	D5107	A-5	Q5002	A-7
D5006	B-8	D5108	A-5	Q5003	A-7
D5008	C-7	D5109	C-1	Q5004	A-8
D5009	A-7	D5110	C-1	Q5101	C-2
D5010	C-7	D5111	C-2	Q5102	C-2
D5011	B-7	D5132	C-2	Q5109	B-2
D5012	B-7			Q5110	B-2
D5013	C-6	IC511	C-5		
D5101	B-5	IC512	B-1		

4-3. SEMICONDUCTOR LEAD LAYOUTS

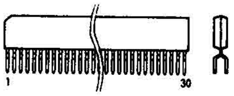
BA7021
LA6393S
LA6458SK
RC4558S



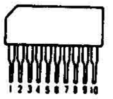
LA7213


MARKING
SIDE
VIEW
1 2 3 4 5

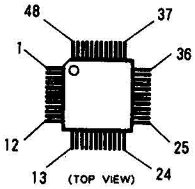
LA7294



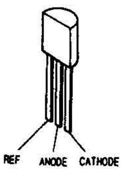
LB1641


1 2 3 4 5 6 7 8 9 10

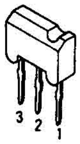
LC7418


48
37
1
36
12
25
13
(TOP VIEW)
24

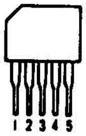
L5431


REF
ANODE
CATHODE

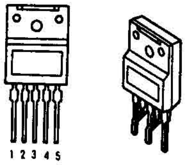
MN1380-L



M51953AL



SI3120CA



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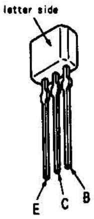
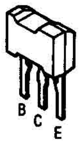
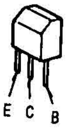
DTC144ES
DTC114ES
2SA1175-HFE
2SC2785-HFE


letter side
E
C
B

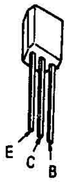
2SA1428-Y
2SB1050-R



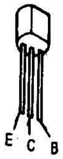
2SB734-34



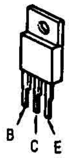
2SC536-G-AC
2SC2668
2SC3330-T



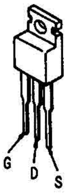
2SC1815-GR



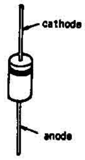
2SC3851-O



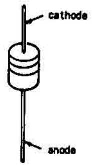
2SK1460-YA



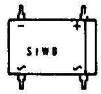
AG01-V2
APOIC-V0
DLE30C-KC9
EM-1Z
ERA15-04A-V5
RK44LF-M1
1SS83


cathode
anode

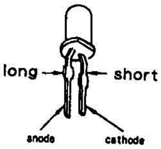
GZB18C
GZS2.0X-BT
MTZJ-T-77-12A
MTZ13C-T-77
RD15ES-B3
RD5.1ES-B2
RD8.2ES-B2
RD9.1ES-B3
UZ-4.7BSC
1SS119
1SS120


cathode
anode

S1WBA60



EBR3668S


long
short
anode
cathode

SECTION 5
EXPLODED VIEWS

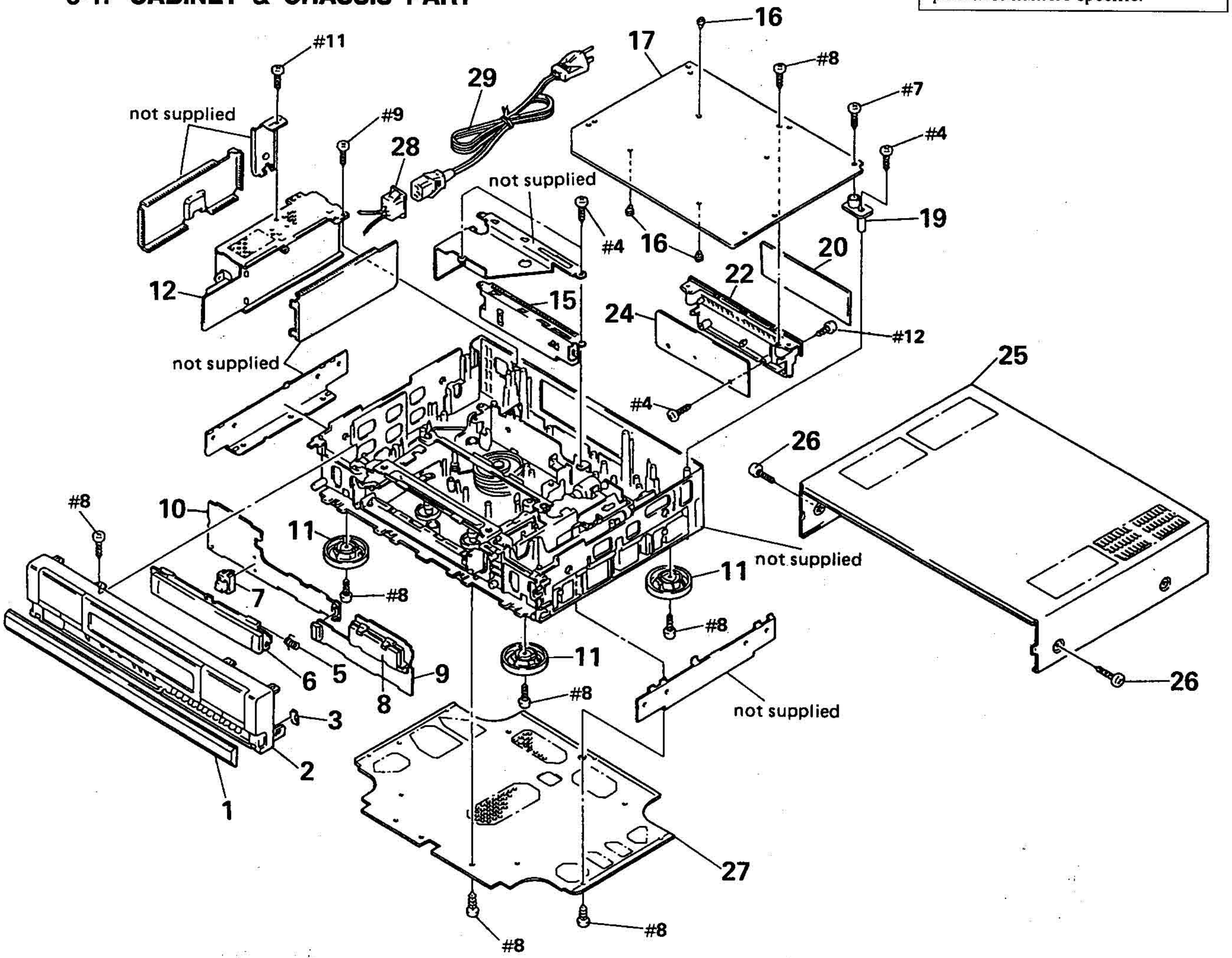
NOTE:

- -XX,-X mean standardized parts, so they may have some difference from the original one.
- Items marked " ＊ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

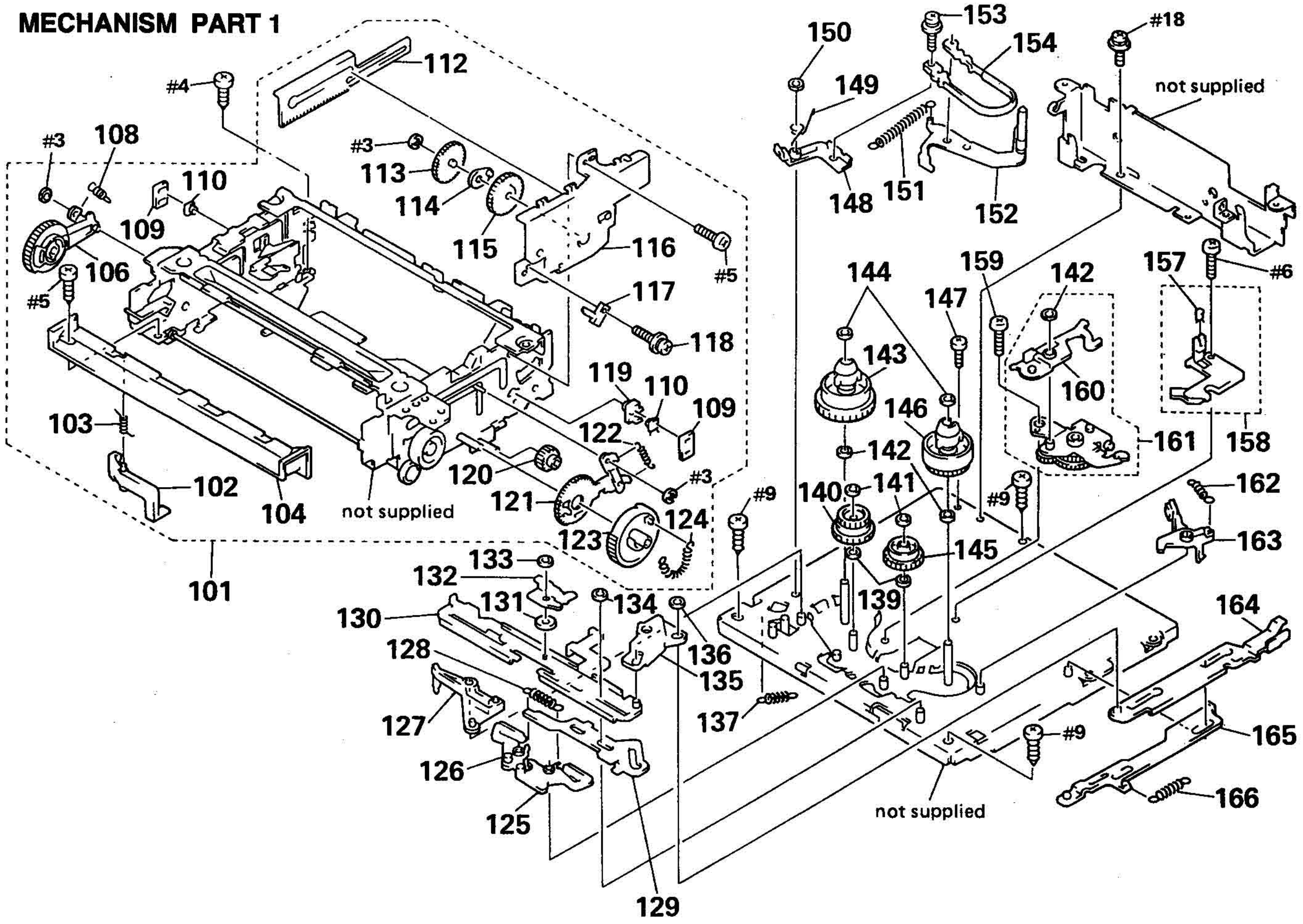
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

5-1. CABINET & CHASSIS PART



Ref. No.	Part No.	Description	Remark
1	A-6704-730-A	DOOR ASSY	
2	A-6704-728-A	CABINET ASSY, FRONT	
3	3-740-330-01	LOCK	
5	3-735-605-01	SPRING	
6	3-946-565-01	DOOR, CASSETTE	
7	3-946-790-01	BUTTON (TIMER/AUDIO)	
8	3-946-546-01	INDICATOR	
* 9	A-6756-916-A	TM-1 BOARD, COMPLETE	
* 10	A-6756-868-A	TM-2 BOARD, COMPLETE	
11	3-946-553-01	STAND	
* 12	A-6756-365-A	PW-1 BOARD, COMPLETE	
* 15	A-6756-917-A	VP-1 BOARD, COMPLETE	
16	3-747-603-01	FIXER	
* 17	A-6756-919-A	CP-1 BOARD, COMPLETE	
19	3-946-548-01	HOLDER	
* 20	3-951-926-01	SHEET, DEC BACK	
* 22	3-952-156-01	BRACKET, TERMINAL	
* 24	A-6756-918-A	TB-1 BOARD, COMPLETE	
25	3-946-564-01	COVER, TOP	
26	3-740-382-01	+BTS-B S 4X12	
27	3-946-561-01	COVER, BOTTOM	
⚠28	1-695-413-11	CONNECTOR, INLET	
⚠29	1-690-826-11	CORD, POWER (UL)	

5-2. MECHANISM PART 1



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#4
#3
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#5
#3
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#5
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not supplied
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119
110
109
122
120
#3
121
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123
133
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126
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#18
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148
151
152
not supplied
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142
157
#6
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158
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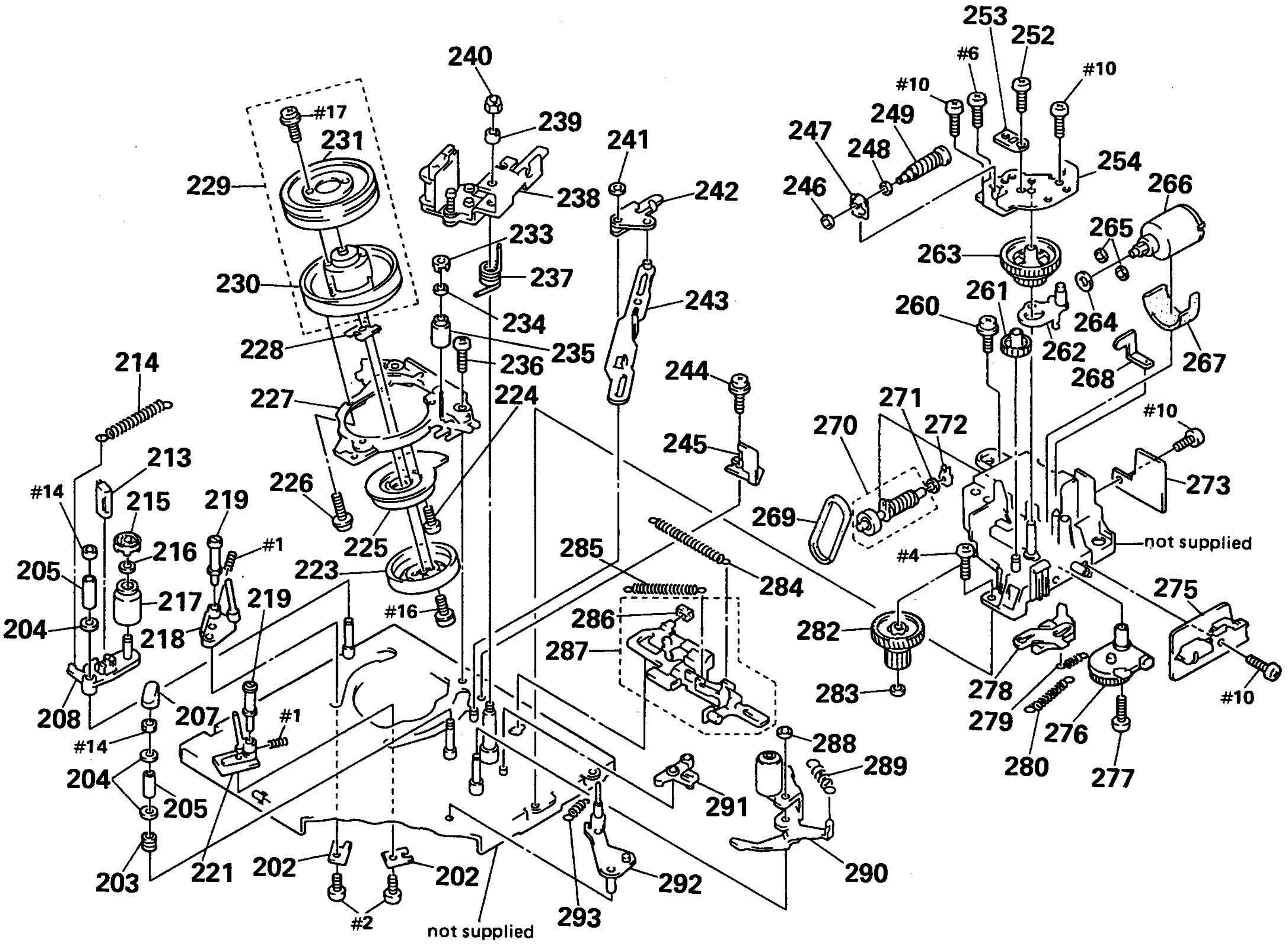
141
140
#9
#9
162
145
139
163
164
#9
165
not supplied
166

Ref. No.	Part No.	Description	Remark
101	A-6773-655-A	MECHANICAL ASSY, CASSETTE	
102	3-942-686-01	LEVER, SAFETY SWITCH	
103	3-942-688-01	SPRING, SAFETY SWITCH	
104	3-946-536-01	BOARD, UNDER	
106	3-735-719-01	LEVER (L) ASSY, GEAR	
108	3-735-720-01	SPRING	
109	3-735-734-01	LID	
110	1-808-710-11	PHOTO TRANSISTOR	
112	3-740-344-01	LOCK	
113	3-735-731-01	GEAR, LOCK	
114	3-735-732-01	LEVER ASSY, PINION	
115	3-735-730-01	GEAR, PINION	
116	3-740-342-01	BRACKET, GEAR	
117	3-735-729-01	SW, LEAF	
118	3-735-775-01	SCREW (2X9), +PSW	
* 119	3-735-733-01	HOLDER, TR	
120	3-735-728-01	GEAR, IDLER	
121	3-735-723-01	GEAR ASSY, LEVER	
122	3-735-726-01	SPRING	
123	3-735-724-01	GEAR, MAIN	
124	3-735-725-01	SPRING	
125	3-951-928-01	BRAKE (ASSY), TAKE-UP	
126	3-951-929-01	SUPPLY (ASSY), BRAKE	
127	3-735-655-01	BRAKE SUB, S	
128	3-735-658-01	SPRING	
* 129	3-735-628-01	BRAKE, SLIDE ACT	
130	3-953-276-01	PLATE ASSY, SLIDE M	
131	3-947-301-01	WASHER (Y)	
132	3-947-594-01	LEVER, ONE-WAY LOCK	
133	3-947-302-01	WASHER, SPECIAL	
134	3-735-761-01	WASHER (DIA. 2.6)	
135	3-735-663-01	LEVER, CONTROL	
136	3-746-725-01	WASHER, SPECIAL	
137	3-740-348-01	SPRING	
139	3-735-750-01	WASHER (DIA. 2.6), SPECIAL	
140	3-946-525-01	GEAR (ASSY), ONE-WAY	
141	3-741-401-01	WASHER Y 2.1X6X0.25	
142	3-735-754-01	WASHER (DIA. 3), ADJUSTMENT	
143	3-946-510-01	REEL (SUPPLY) (ASSY)	
144	3-735-755-01	WASHER (DIA. 2.6)	
145	3-946-530-01	GEAR, REEL TAKE-UP	
146	3-946-509-01	REEL (TAKE-UP) (ASSY)	
147	3-746-714-01	SCREW (3X12), SPECIAL	
148	3-946-527-01	BAND (ASSY), LEVER BRAKE	
149	3-946-535-01	SPRING, LEVER BRAKE	
150	3-946-499-01	WASHER, SPECIAL	
151	3-946-532-01	SPRING, LEVER TENSION	
152	3-946-528-01	TENSION (ASSY), LEVER	
153	3-946-498-01	SCREW (2.6X2.4), SCR PAN +FLG	
154	3-946-520-01	HOLDER (ASSY), BAND	
157	1-808-722-11	DIODE LN59	
* 158	A-6756-374-A	MC-4 BOARD, COMPLETE	
159	3-942-657-01	SCREW (2.6X4), SPECIAL	
160	3-946-526-01	IDLER (ASSY)	
161	A-6773-660-A	CLUTCH ASSY, IDLER	
162	3-735-665-01	SPRING	
163	3-740-349-01	ASSY, BRAK SUB T	
164	3-946-523-01	PLATE (ASSY), ACT, SLIDE	
* 165	3-735-626-01	BRAKE (C) ASSY	
166	3-735-627-01	SPRING	

5-3. MECHANISM PART 2



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#17
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#10
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not supplied
#4
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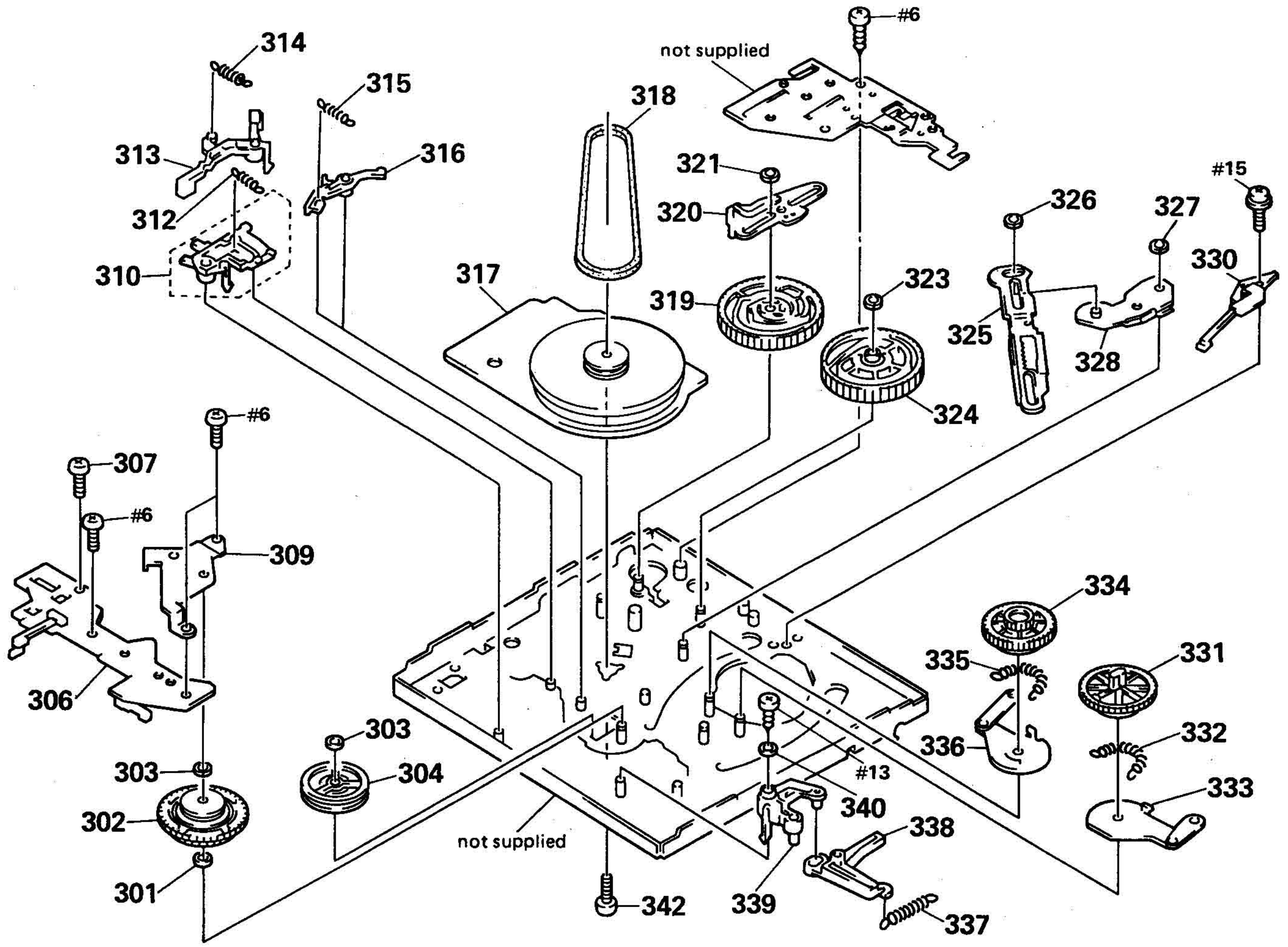
283
278
279
276
280
277
#10

Ref. No.	Part No.	Description	Remark
202	3-735-631-01	PLATE, GUIDE	
203	3-735-677-01	SPRING	
204	3-741-408-01	WASHER, SPECIAL	
205	3-942-674-01	GUIDE, TAPE	
207	3-943-187-01	CAP	
208	3-951-930-01	LEVER (ASSY), FE HEAD	
213	3-735-687-01	HEAD, FTE	
214	3-735-686-01	SPRING	
215	3-947-300-01	BRACKET, INPEDANCE	
216	3-946-500-01	WASHER (SLIT) (1.6X4X0.25)	
217	3-946-517-01	ROLLER	
218	3-946-544-01	ROLLER (S) (BASE) (ASSY)	
219	3-735-630-01	ROLLER ASSY, GUIDE	
221	3-735-632-01	ROLLER (T) ASSY, BASE	
* 223	1-461-017-11	ROTOR	
224	3-741-416-01	SCR PAN+SW+W 2.3X10	
225	1-462-284-11	STATOR	
226	3-740-370-01	SCREW (2.6X8), SPECIAL	
227	3-946-547-01	CYLINDER (BASE) (ASSY)	
228	3-735-738-01	SPACER, MOTOR	
229	A-6050-869-A	CYLINDER (2N4N-Q) BOARD, COMPLETE	
230	3-746-722-01	CYLINDER (LWR4)	
231	3-946-562-01	CYLINDER (UPR 2N4N-Q)	
233	3-946-513-01	BRACKET	
234	3-946-496-01	WASHER (Y) (1.6X3.2X0.25)	
235	3-946-514-01	ROLLER	
236	3-740-398-01	SCR PAN+FLG 3X6	
237	3-735-680-01	SPRING	
238	3-735-679-01	BRACKET, COMPL	
239	3-749-106-01	SPACER	
240	3-735-682-01	NUT (M5), SPECIAL	
241	3-735-759-01	WASHER (DIA. 3)	
* 242	3-735-673-01	PINCH LEVER ASSY	
* 243	3-735-672-01	SLIDE ASSY, PINCH	
244	3-741-410-01	SCR PAN+SE+W 2.6X5	
245	3-942-071-01	STOPPER, BRACKET	
246	3-741-412-01	WASHER, SPECIAL	
247	3-735-696-01	HOLDER, WORM	
248	3-740-357-01	WASHER	
249	3-735-706-01	WORM ASSY, F	
252	3-740-355-01	SCREW (+P) (2.6X5)	
253	3-735-711-01	SENSOR ASSY, DEW	
254	3-942-065-01	BRACKET, HOLDER	
260	3-741-414-01	SCR PAN+SW+W 2.6X6	
261	3-735-704-01	GEAR	
262	3-740-366-01	LEVER, FRONT	
263	3-735-703-01	GEAR (F), HELICAL	
264	3-735-708-01	DAMPER, WORM	
265	3-740-365-01	DAMPER, MOTOR	
266	3-942-091-01	MOTOR ASSY, THREADING	
267	3-740-358-01	DAMPER, MOTOR	
268	3-740-354-01	PLATE, NUT	
269	3-735-709-01	BELT (LOADING)	
270	3-740-359-01	LOAD WORM	
271	3-735-774-01	WASHER (DIA. 2)	
272	3-741-413-01	HOLDER WORM	
* 273	1-589-269-11	MC-3 BOARD	
* 275	3-746-718-01	HOLDER, HARNESS	
276	1-572-383-11	SWITCH, ROTARY	
277	3-741-411-01	SCR PAN 2.6X13	
278	3-740-362-01	SLIDE, FRONT	
279	3-740-363-01	SPRING	
280	3-740-364-01	SPRING	
282	3-740-361-01	GEAR, HELICAL	
283	3-740-367-01	WASHER, SLIT	
284	3-735-669-01	SPRING	
285	3-946-534-01	SPRING, SLIDE BRAKE	
286	3-735-668-01	DAMPER	
287	3-946-521-01	CAM (ASSY), SLIDE	
288	3-735-757-01	WASHER (DIA. 3.6)	
289	3-735-675-01	SPRING	
290	3-735-674-01	PINCH ROLLER, COMPL	
291	3-735-671-01	LEVER, ACT BRAKE	
292	3-749-023-01	GUIDE (REV), LEVER ASSY	
293	3-735-660-01	SPRING	

5-4. MECHANISM PART 3



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Ref. No.	Part No.	Description	Remark
301	3-735-760-01	WASHER (DIA. 3), SPECIAL	
302	3-946-524-01	FRICTION (ASSY), GEAR	
303	3-948-603-01	WASHER, SPECIAL	
304	3-946-531-01	PULLEY, REEL	
* 306	A-6756-375-A	MC-1 BOARD, COMPLETE	
307	3-740-396-01	SCR STPG BIN 2.6X5	
309	3-946-529-01	PULLEY, BRACKET	
310	3-947-435-01	CLUTCH (ASSY), LEVER	
312	3-735-646-01	SPRING	
313	3-735-649-01	BRAKE ASSY, CAP	
314	3-741-405-01	CAPSTAN, SPRING	
315	3-735-648-01	SPRING	
316	3-735-647-01	LEVER, CONVERSION CLUTCH	
317	3-946-560-01	CAPSTAN (MOTOR)	
318	3-946-511-01	BELT, REEL DRIVE	
319	3-946-519-01	CAM, MODE	
* 320	3-735-643-01	PLATE ASSY, CAM	
321	3-735-759-01	WASHER (DIA. 3)	
323	3-735-756-01	WASHER (DIA. 3)	
324	3-946-559-01	CAM, MAIN	
325	3-735-642-01	RACK, LOAD	
326	3-735-758-01	WASHER (DIA. 2.6)	
327	3-735-757-01	WASHER (DIA. 3.6)	
328	3-735-641-01	LEVER ASSY, LOAD CAM	
330	3-735-693-01	PLATE ASSY, GROUND	
331	3-746-724-01	ROAD (S), GEAR	
332	3-735-634-01	SPRING	
333	3-735-633-01	LOAD (S) ASSY, LEVER	
334	3-749-022-01	LOAD, GEAR T	
335	3-735-637-01	SPRING (T)	
336	3-735-636-01	LOAD (T) ASSY, LEVER	
337	3-946-533-01	SPRING, REVERSE TENSION	
338	3-946-518-01	LEVER, RETURN TENSION	
339	3-740-368-01	CONTROL ASSY, LEVER	
340	3-735-765-01	WASHER (DIA. 2.6)	
342	3-740-355-01	SCREW (+P) (2.6X5)	

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL:Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F:nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u:μ, for example:
  uA..: μA.. uPA..: μPA..
  uPB..: μPB.. uPC..: μPC.. uPD..: μPD..
- CAPACITORS
  uF: μF
- COILS
  uH: μH

When indicating parts by reference number, please include the board.

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remark
*	A-6756-919-A	CP-1 BOARD, COMPLETE			
		*********************			
		< CAPACITOR >			
C1001	1-162-207-31	CERAMIC	22PF	5%	50V
C1002	1-162-289-11	CERAMIC	390PF	10%	50V
C1003	1-162-199-31	CERAMIC	10PF	5%	50V
C1004	1-126-529-11	ELECT	0.47uF	20%	50V
C1005	1-162-211-31	CERAMIC	33PF	5%	50V
C1006	1-101-880-00	CERAMIC	47PF	5%	50V
C1007	1-164-072-11	CERAMIC	120PF	5%	50V
C1008	1-124-767-00	ELECT	2.2uF	20%	50V
C1009	1-161-494-00	CERAMIC	0.022uF		25V
C1010	1-124-257-00	ELECT	2.2uF	20%	50V
C1011	1-124-465-00	ELECT	0.47uF	20%	50V
C1012	1-164-073-11	CERAMIC	100PF	10%	50V
C1013	1-164-073-11	CERAMIC	100PF	10%	50V
C1014	1-130-493-00	MYLAR	0.068uF	5%	50V
C1015	1-161-494-00	CERAMIC	0.022uF		25V
C1016	1-161-379-00	CERAMIC	0.01uF	20%	25V
C1017	1-161-494-00	CERAMIC	0.022uF		25V
C1018	1-126-176-11	ELECT	220uF	20%	10V
C1019	1-124-257-00	ELECT	2.2uF	20%	50V
C1020	1-126-157-11	ELECT	10uF	20%	16V
C1021	1-124-257-00	ELECT	2.2uF	20%	50V
C1022	1-124-224-11	ELECT	47uF	20%	6.3V
C1023	1-161-379-00	CERAMIC	0.01uF	20%	25V
C1024	1-124-234-00	ELECT	22uF	20%	16V
C1025	1-124-465-00	ELECT	0.47uF	20%	50V
C1026	1-126-301-11	ELECT	1uF	20%	50V
C1027	1-126-301-11	ELECT	1uF	20%	50V
C1028	1-124-234-00	ELECT	22uF	20%	16V
C1031	1-161-379-00	CERAMIC	0.01uF	20%	25V
C1032	1-124-589-11	ELECT	47uF	20%	16V
C1033	1-126-301-11	ELECT	1uF	20%	50V
C1034	1-162-212-31	CERAMIC	36PF	5%	50V
C1035	1-162-195-31	CERAMIC	4.7PF	10%	50V
C1036	1-162-216-31	CERAMIC	51PF	5%	50V
C1037	1-126-163-11	ELECT	4.7uF	20%	50V
C1038	1-161-379-00	CERAMIC	0.01uF	20%	25V
C1039	1-161-379-00	CERAMIC	0.01uF	20%	25V
C1040	1-162-290-31	CERAMIC	470PF	10%	50V
C1041	1-126-154-11	ELECT	47uF	20%	6.3V
C1043	1-161-063-00	CERAMIC	0.1uF	10%	50V
C1044	1-161-375-00	CERAMIC	0.0022uF	20%	50V
C1045	1-164-072-11	CERAMIC	120PF	5%	50V
C1101	1-161-053-00	CERAMIC	0.015uF	10%	50V
C1102	1-161-379-00	CERAMIC	0.01uF	20%	25V
C1103	1-126-301-11	ELECT	1uF	20%	50V
C1104	1-162-292-31	CERAMIC	680PF	10%	50V
C1105	1-124-257-00	ELECT	2.2uF	20%	50V
C1106	1-126-301-11	ELECT	1uF	20%	50V
C1107	1-161-494-00	CERAMIC	0.022uF		25V
C1108	1-161-021-11	CERAMIC	0.047uF	10%	25V
C1109	1-161-379-00	CERAMIC	0.01uF	20%	25V
C1110	1-161-494-00	CERAMIC	0.022uF		25V
C1111	1-161-063-00	CERAMIC	0.1uF	10%	50V
C1112	1-126-301-11	ELECT	1uF	20%	50V
C1113	1-161-379-00	CERAMIC	0.01uF	20%	25V
C1114	1-162-214-31	CERAMIC	43PF	5%	50V
C1115	1-162-211-31	CERAMIC	33PF	5%	50V
C1116	1-161-063-00	CERAMIC	0.1uF	10%	50V
C1117	1-126-154-11	ELECT	47uF	20%	6.3V
C1118	1-164-073-11	CERAMIC	100PF	10%	50V
C1119	1-161-379-00	CERAMIC	0.01uF	20%	25V
C1121	1-161-379-00	CERAMIC	0.01uF	20%	25V
C1128	1-164-072-11	CERAMIC	120PF	5%	50V
C1130	1-162-207-31	CERAMIC	22PF	5%	50V
C1132	1-161-494-00	CERAMIC	0.022uF		25V
C1351	1-101-880-00	CERAMIC	47PF	5%	50V
C1352	1-162-212-31	CERAMIC	36PF	5%	50V
C1401	1-161-379-00	CERAMIC	0.01uF	20%	25V
C1402	1-161-063-00	CERAMIC	0.1uF	10%	50V
C1403	1-124-234-00	ELECT	22uF	20%	16V
C1501	1-161-063-00	CERAMIC	0.1uF	10%	50V
C1502	1-126-155-11	ELECT	100uF	20%	6.3V
C1504	1-126-162-11	ELECT	3.3uF	20%	50V
C1505	1-162-212-31	CERAMIC	36PF	5%	50V
C1506	1-164-060-11	CERAMIC	39PF	5%	50V
C1507	1-162-282-11	CERAMIC	100PF	10%	50V

CP-1

Ref. No.	Part No.	Description			Remark
C1508	1-162-282-11	CERAMIC	100PF	10%	50V
C1509	1-162-282-11	CERAMIC	100PF	10%	50V
C1510	1-126-155-11	ELECT	100uF	20%	6.3V
C1511	1-161-063-00	CERAMIC	0.1uF	10%	50V
C1513	1-126-301-11	ELECT	1uF	20%	50V
C1518	1-126-163-11	ELECT	4.7uF	20%	50V
C1519	1-124-767-00	ELECT	2.2uF	20%	50V
C1520	1-161-063-00	CERAMIC	0.1uF	10%	50V
C1521	1-124-589-11	ELECT	47uF	20%	16V
C1522	1-161-063-00	CERAMIC	0.1uF	10%	50V
C1523	1-161-063-00	CERAMIC	0.1uF	10%	50V
C1551	1-161-063-00	CERAMIC	0.1uF	10%	50V
C1552	1-126-155-11	ELECT	100uF	20%	6.3V
C1553	1-126-301-11	ELECT	1uF	20%	50V
C1554	1-164-073-11	CERAMIC	100PF	10%	50V
C1555	1-164-077-11	CERAMIC	220PF	10%	50V
C1556	1-162-209-31	CERAMIC	27PF	5%	50V
C1605	1-126-168-11	ELECT	1000uF	20%	6.3V
C1609	1-126-301-11	ELECT	1uF	20%	50V
C2001	1-161-494-00	CERAMIC	0.022uF		25V
C2004	1-161-040-00	CERAMIC	0.0012uF	10%	25V
C2005	1-124-937-11	ELECT	10uF	20%	16V
C2006	1-124-034-51	ELECT	33uF	20%	16V
C2007	1-161-379-00	CERAMIC	0.01uF	20%	25V
C2008	1-124-252-00	ELECT	0.33uF	20%	50V
C2009	1-124-234-00	ELECT	22uF	20%	16V
C2010	1-161-377-00	CERAMIC	0.0047uF	20%	16V
C2011	1-126-157-11	ELECT	10uF	20%	16V
C2012	1-124-589-11	ELECT	47uF	20%	16V
C2013	1-124-831-11	ELECT	4.7uF	20%	25V
C2014	1-161-379-00	CERAMIC	0.01uF	20%	25V
C2017	1-126-163-11	ELECT	4.7uF	20%	50V
C2018	1-161-379-00	CERAMIC	0.01uF	20%	25V
C2019	1-126-163-11	ELECT	4.7uF	20%	50V
C2021	1-161-379-00	CERAMIC	0.01uF	20%	25V
C2022	1-161-379-00	CERAMIC	0.01uF	20%	25V
C2023	1-162-286-31	CERAMIC	220PF	10%	50V
C2024	1-110-363-11	CAP, POLYP	6800PF 100V		
C2025	1-124-257-00	ELECT	2.2uF	20%	50V
C2029	1-124-911-11	ELECT	220uF	20%	50V
C2030	1-124-034-51	ELECT	33uF	20%	16V
C2031	1-124-034-51	ELECT	33uF	20%	16V
C2033	1-124-465-00	ELECT	0.47uF	20%	50V
C2034	1-136-165-00	FILM	0.1uF	5%	50V
C2035	1-161-040-00	CERAMIC	0.0012uF	10%	25V
C3001	1-124-443-00	ELECT	100uF	20%	10V
C3002	1-161-063-00	CERAMIC	0.1uF	10%	50V
C3003	1-161-039-00	CERAMIC	0.001uF	10%	50V
C3004	1-124-463-00	ELECT	0.1uF	20%	50V
C3005	1-161-063-00	CERAMIC	0.1uF	10%	50V
C3006	1-162-286-31	CERAMIC	220PF	10%	50V
C3008	1-161-379-00	CERAMIC	0.01uF	20%	25V
C3009	1-161-063-00	CERAMIC	0.1uF	10%	50V
C3010	1-161-379-00	CERAMIC	0.01uF	20%	25V
C3011	1-161-039-00	CERAMIC	0.001uF	10%	50V
C3012	1-124-443-00	ELECT	100uF	20%	10V
C3014	1-161-379-00	CERAMIC	0.01uF	20%	25V
C3015	1-161-379-00	CERAMIC	0.01uF	20%	25V
C3501	1-130-491-00	MYLAR	0.047uF	5%	50V
C3502	1-136-165-00	FILM	0.1uF	5%	50V
C3503	1-136-165-00	FILM	0.1uF	5%	50V
C3504	1-130-491-00	MYLAR	0.047uF	5%	50V
C3505	1-130-489-00	MYLAR	0.033uF	5%	50V
C3506	1-161-055-00	CERAMIC	0.022uF	10%	50V
C3507	1-130-487-00	MYLAR	0.022uF	5%	50V
C3508	1-130-481-00	MYLAR	0.0068uF	5%	50V
C3510	1-136-169-00	FILM	0.22uF	5%	50V
C3512	1-161-379-00	CERAMIC	0.01uF	20%	25V
C3513	1-161-374-11	CERAMIC	0.0015uF	20%	50V
C3514	1-161-375-00	CERAMIC	0.0022uF	20%	50V
C3515	1-161-015-11	CERAMIC	0.015uF	10%	25V
C3516	1-161-329-00	CERAMIC	0.0068uF	30%	25V
C3517	1-161-379-00	CERAMIC	0.01uF	20%	25V
C3518	1-124-234-00	ELECT	22uF	20%	16V
C3519	1-124-234-00	ELECT	22uF	20%	16V
C3520	1-124-234-00	ELECT	22uF	20%	16V
C3521	1-124-234-00	ELECT	22uF	20%	16V
C3522	1-161-039-00	CERAMIC	0.001uF	10%	50V
C3523	1-161-039-00	CERAMIC	0.001uF	10%	50V
C3524	1-130-487-00	MYLAR	0.022uF	5%	50V
C3525	1-130-479-00	MYLAR	0.0047uF	5%	50V
C3526	1-130-479-00	MYLAR	0.0047uF	5%	50V
C3527	1-162-286-31	CERAMIC	220PF	10%	50V
C3528	1-161-063-00	CERAMIC	0.1uF	10%	50V
C3529	1-124-443-00	ELECT	100uF	20%	10V
C3530	1-124-443-00	ELECT	100uF	20%	10V
C3531	1-161-063-00	CERAMIC	0.1uF	10%	50V
C3532	1-130-483-00	MYLAR	0.01uF	5%	50V
C3533	1-136-169-00	FILM	0.22uF	5%	50V
C3534	1-162-286-31	CERAMIC	220PF	10%	50V
C3535	1-130-484-00	MYLAR	0.012uF	5%	50V
C3536	1-124-034-51	ELECT	33uF	20%	16V
C3537	1-161-063-00	CERAMIC	0.1uF	10%	50V
C3538	1-161-061-11	CERAMIC	0.068uF	10%	50V
C3539	1-136-165-00	FILM	0.1uF	5%	50V
C3540	1-130-481-00	MYLAR	0.0068uF	5%	50V
C3541	1-124-443-00	ELECT	100uF	20%	10V
C3542	1-136-165-00	FILM	0.1uF	5%	50V

Ref. No.	Part No.	Description		Remark	
C3543	1-124-499-11	ELECT, NONPOLAR	1uF	20%	50V
C3544	1-124-499-11	ELECT, NONPOLAR	1uF	20%	50V
C3545	1-124-499-11	ELECT, NONPOLAR	1uF	20%	50V
C3546	1-124-499-11	ELECT, NONPOLAR	1uF	20%	50V
C3547	1-161-379-00	CERAMIC	0.01uF	20%	25V
C3548	1-161-379-00	CERAMIC	0.01uF	20%	25V
C3549	1-161-379-00	CERAMIC	0.01uF	20%	25V
C3550	1-161-379-00	CERAMIC	0.01uF	20%	25V
C3551	1-126-157-11	ELECT	10uF	20%	16V
C3552	1-124-242-00	ELECT	33uF	20%	25V
C3553	1-126-157-11	ELECT	10uF	20%	16V
C3554	1-162-292-31	CERAMIC	680PF	10%	50V
C3556	1-161-039-00	CERAMIC	0.001uF	10%	50V
C3557	1-161-039-00	CERAMIC	0.001uF	10%	50V
C3558	1-130-489-00	MYLAR	0.033uF	5%	50V
C3559	1-161-063-00	CERAMIC	0.1uF	10%	50V
C3560	1-126-155-11	ELECT	100uF	20%	6.3V
C3561	1-162-211-31	CERAMIC	33PF	5%	50V
C3562	1-161-379-00	CERAMIC	0.01uF	20%	25V
C3563	1-126-157-11	ELECT	10uF	20%	16V
C3566	1-162-282-31	CERAMIC	100PF	10%	50V
C3570	1-161-039-00	CERAMIC	0.001uF	10%	50V
C3571	1-130-487-11	FILM	0.0022uF	5%	50V
C3572	1-161-379-11	CERAMIC	0.01uF	20%	25V
C7301	1-126-168-11	ELECT	1000uF	20%	6.3V
C7302	1-161-039-00	CERAMIC	0.001uF	10%	50V

< DIODE >

Ref. No.	Part No.	Description		Remark
D1002	8-719-911-19	DIODE	1SS119	
D1031	8-719-110-13	DIODE	RD9.1ES-B2	
D1103	8-719-911-19	DIODE	1SS119	
D1401	8-719-912-20	DIODE	1SS120	
D1402	8-719-912-20	DIODE	1SS120	
D1403	8-719-912-20	DIODE	1SS120	
D1405	8-719-912-20	DIODE	1SS120	
D1501	8-719-912-20	DIODE	1SS120	
D1502	8-719-912-20	DIODE	1SS120	
D3001	8-719-300-45	DIODE	EM-1Z	
D3005	8-719-110-42	DIODE	RD15ES-B3	
D3006	8-719-110-08	DIODE	RD8.2ES-B2	
D3007	8-719-911-19	DIODE	1SS119	
D3008	8-719-911-19	DIODE	1SS119	
D3009	8-719-911-19	DIODE	1SS119	
D3010	8-719-911-19	DIODE	1SS119	
D3501	8-719-911-19	DIODE	1SS119	
D3502	8-719-911-19	DIODE	1SS119	
D3503	8-719-911-19	DIODE	1SS119	
D3504	8-719-911-19	DIODE	1SS119	
D3514	8-719-911-19	DIODE	1SS119	
D3515	8-719-911-19	DIODE	1SS119	
D3517	8-719-911-19	DIODE	1SS119	
D3519	8-719-911-19	DIODE	1SS119	
D3520	8-719-911-19	DIODE	1SS119	
D3521	8-719-911-19	DIODE	1SS119	
D3522	8-719-911-19	DIODE	1SS119	
D3523	8-719-911-19	DIODE	1SS119	
D3524	8-719-911-19	DIODE	1SS119	
D3525	8-719-911-19	DIODE	1SS119	
D3526	8-719-911-19	DIODE	1SS119	
D3527	8-719-911-19	DIODE	1SS119	
D3528	8-719-911-19	DIODE	1SS119	
D3531	8-719-911-19	DIODE	1SS119	
D3533	8-719-911-19	DIODE	1SS119	
D3534	8-719-911-19	DIODE	1SS119	
D7301	8-719-300-45	DIODE	EM-1Z	
D7302	8-719-300-45	DIODE	EM-1Z	
D7303	8-719-911-19	DIODE	1SS119	
D7304	8-719-911-19	DIODE	1SS119	
D7305	8-719-911-19	DIODE	1SS119	
D7306	8-719-911-19	DIODE	1SS119	
D7307	8-719-911-19	DIODE	1SS119	
D7308	8-719-911-19	DIODE	1SS119	
D7309	8-719-911-19	DIODE	1SS119	
D7310	8-719-911-19	DIODE	1SS119	

< DELAY LINE >

Ref. No.	Part No.	Description		Remark
DL131	1-415-863-11	DELAY LINE		

< IC >

Ref. No.	Part No.	Description		Remark
IC101	8-759-821-84	IC	LA7340S	
IC102	8-759-821-50	IC	LC8991	
IC103	8-759-927-56	IC	BA7021	
IC111	8-759-822-29	IC	LA7332	
IC112	1-809-584-11	IC	LA6393D	
IC141	1-809-587-11	IC	MLC4081B	
IC151	1-809-589-11	IC	M50556-001SP	
IC152	8-759-822-05	IC	LA7213	
IC201	1-808-886-11	IC	LA7294	
IC301	1-809-997-11	IC	LC66516B-4A46	
IC302	8-759-634-97	IC	M51953AL	
IC303	8-759-822-09	IC	LB1641	
IC304	1-809-584-11	IC	LA6393D	
IC351	1-809-772-11	IC	LC7418-8553	
IC352	1-809-586-11	IC	LC9108B-385	
IC353	1-809-033-11	IC	LA7124	
IC354	8-759-932-48	IC	BU4538B	

CP-1

Ref. No.	Part No.	Description	Remark
IC356	8-759-300-71	IC HD14053BFP	
IC357	1-809-994-11	IC LC4013B	
IC358	8-759-932-40	IC BU4030B	
IC359	8-759-300-71	IC HD14053BFP	
IC731	1-809-995-11	IC LC4069UB	
		< COIL >	
L1001	1-410-522-11	INDUCTOR 120uH	
L1002	1-410-515-11	INDUCTOR 33uH	
L1031	1-410-522-11	INDUCTOR 120uH	
L1032	1-410-316-11	INDUCTOR 1uH	
L1101	1-410-512-11	INDUCTOR 18uH	
L1102	1-410-509-11	INDUCTOR 10uH	
L1104	1-410-517-11	INDUCTOR 47uH	
L1501	1-410-511-11	INDUCTOR 15uH	
L1502	1-410-521-11	INDUCTOR 100uH	
L1503	1-410-521-11	INDUCTOR 100uH	
L1504	1-410-521-11	INDUCTOR 100uH	
L2001	1-414-091-11	CHOKE, HF 6800uH	
L2002	1-412-819-11	HF CHOKE 560uH	
L2003	1-412-819-11	HF CHOKE 560uH	
		< TRANSISTOR >	
Q1002	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q1003	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q1004	8-729-900-89	TRANSISTOR DTC144ES	
Q1005	8-729-900-80	TRANSISTOR DTC114ES	
Q1031	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q1032	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q1101	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q1102	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q1103	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q1104	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q1105	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q1151	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q1401	8-729-140-97	TRANSISTOR KSA708	
Q1402	8-729-140-97	TRANSISTOR KSA708	
Q1403	8-729-900-89	TRANSISTOR DTC144ES	
Q1404	8-729-900-89	TRANSISTOR DTC144ES	
Q1405	8-729-900-89	TRANSISTOR DTC144ES	
Q1501	8-729-140-97	TRANSISTOR KSA708	
Q1502	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q1503	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q1601	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q2001	8-729-281-53	TRANSISTOR KSC900-L	
Q3003	8-729-900-89	TRANSISTOR DTC144ES	
Q3501	8-729-900-89	TRANSISTOR DTC144ES	
Q3502	8-729-900-65	TRANSISTOR DTA144ES	
Q3503	8-729-900-65	TRANSISTOR DTA144ES	
Q3504	8-729-900-89	TRANSISTOR DTC144ES	
Q3505	8-729-900-89	TRANSISTOR DTC144ES	
Q3506	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q3507	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q3508	8-729-900-89	TRANSISTOR DTC144ES	
Q3509	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q3510	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q3511	8-729-900-89	TRANSISTOR DTC144ES	
Q3512	8-729-900-89	TRANSISTOR DTC144ES	
Q3513	8-729-900-89	TRANSISTOR DTC144ES	
Q3514	8-729-900-89	TRANSISTOR DTC144ES	
Q7301	8-729-900-89	TRANSISTOR DTC144ES	
Q7302	8-729-900-89	TRANSISTOR DTC144ES	
Q7303	8-729-900-89	TRANSISTOR DTC144ES	
		< RESISTOR >	
R3001	1-212-946-00	FUSIBLE 3.3 5% 1/2W	F
		< TRANSFORMER >	
T2001	1-433-370-11	TRANSFORMER, OSC	
		< THERMISTOR >	
TH101	1-809-330-11	THERMISTOR TD5-C310DB	
		< VARIABLE RESISTOR >	
VR101	1-228-992-11	RES, ADJ, METAL GLAZE 3.3K	
VR102	1-228-994-00	RES, ADJ, METAL 10K	
VR103	1-228-995-00	RES, ADJ, METAL 22K	
VR104	1-241-857-11	VR SEMI 15KB	
VR105	1-228-990-00	RES, ADJ, METAL 1K	
VR201	1-228-997-00	RES, ADJ, METAL 100K	
VR202	1-237-518-21	RES, ADJ 10K	
VR203	1-228-989-00	RES, ADJ, METAL 470	
VR204	1-228-991-00	RES, ADJ, METAL 2.2K	
VR353	1-228-997-00	RES, ADJ, METAL 100K	
VR354	1-228-997-00	RES, ADJ, METAL 100K	
		< VIBRATOR >	
X1101	1-577-456-11	OSCILLATOR, CRYSTAL (3.579545MHz)	
		< FILTER >	
XF101	1-239-357-11	FILTER (Y3MLPF)	
XF102	1-239-258-11	FILTER 4MHz L.P	
XF111	1-579-043-11	FILTER	
XF301	1-577-682-11	RESONATOR, CERAMIC (4MHz)	

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Ref. No.	Part No.	Description			Remark
*	A-6756-375-A	MC-1 BOARD, COMPLETE *********************			
	1-571-932-11	SWITCH, LEAF			
	1-808-723-11	PHOTO COUPLER SPI-315-04-C			
	3-735-744-01	SPACER, PHOTO SENSOR			
***					
*	A-6756-374-A	MC-4 BOARD, COMPLETE *********************			
	1-808-722-11	DIODE LN59			
***					
*	A-6756-365-A	PW-1 BOARD, COMPLETE *********************			
⚠	1-690-826-11	CORD, POWER (UL)			
⚠	1-695-413-11	CONNECTOR, INLET			
	7-685-645-79	SCREW +BTP 3X6 TYPE2 N-S			
		< CAPACITOR >			
⚠C5001	1-137-547-11	MT-POLYEST	0.033uF		250V
⚠C5002	1-137-547-11	MT-POLYEST	0.033uF		250V
⚠C5003	1-161-740-00	CERAMIC	470PF	10%	400V
⚠C5004	1-161-740-00	CERAMIC	470PF	10%	400V
⚠C5006	1-161-740-00	CERAMIC	470PF	10%	400V
⚠C5007	1-161-740-00	CERAMIC	470PF	10%	400V
C5010	1-124-810-11	ELECT	100uF	20%	200V
C5011	1-126-163-11	ELECT	4.7uF	20%	50V
C5012	1-137-542-11	MT-POLYEST	0.047uF		630V
C5013	1-130-728-00	FILM	0.0022uF	5%	50V
C5014	1-130-495-00	MYLAR	0.1uF	5%	50V
C5016	1-165-171-11	CAP, CERAMIC	220PF		500V
C5018	1-124-791-11	ELECT	1.0uF	20%	100V
C5019	1-130-489-00	MYLAR	0.033uF	5%	50V
C5101	1-128-488-11	CAP, ELECT	820uF		6.3V
C5102	1-126-103-11	ELECT	470uF	20%	16V
C5105	1-126-103-11	ELECT	470uF	20%	16V
C5106	1-126-103-11	ELECT	470uF	20%	16V
C5108	1-124-910-11	ELECT	47uF	20%	50V
C5109	1-124-918-11	ELECT	47uF	20%	63V
C5110	1-126-176-11	ELECT	220uF	20%	10V
C5111	1-130-495-00	MYLAR	0.1uF	5%	50V
C5113	1-124-455-00	ELECT	100uF	20%	16V
C5115	1-126-162-11	ELECT	3.3uF	20%	50V
C5116	1-126-154-11	ELECT	47uF	20%	6.3V
C5117	1-124-455-00	ELECT	100uF	20%	16V
C5120	1-130-495-00	MYLAR	0.1uF	5%	50V
C5122	1-124-464-11	ELECT	0.22uF	20%	50V
C5124	1-130-495-00	MYLAR	0.1uF	5%	50V
C5125	1-130-495-00	MYLAR	0.1uF	5%	50V
C5126	1-126-162-11	ELECT	3.3uF	20%	50V

Ref. No.	Part No.	Description		Remark
		< DIODE >		
⚠D5001	1-809-609-11	DIODE	DBC10E	
D5002	1-808-899-11	DIODE	AG01-V2	
D5003	8-719-901-83	DIODE	1SS83	
D5005	1-809-610-11	DIODE	MTZJ20B-T-77	
D5006	8-719-912-20	DIODE	1SS120	
D5008	8-719-901-83	DIODE	1SS83	
D5009	8-719-901-83	DIODE	1SS83	
D5010	8-719-901-83	DIODE	1SS83	
D5011	8-719-901-83	DIODE	1SS83	
D5012	8-719-901-83	DIODE	1SS83	
D5013	1-809-611-11	DIODE	PHOTO COUPLER ON3131-R	
D5101	1-809-095-11	TRANSISTOR	RL2Z-LF-B1	
D5104	1-809-095-11	TRANSISTOR	RL2Z-LF-B1	
D5105	8-719-901-83	DIODE	1SS83	
D5106	8-719-901-83	DIODE	1SS83	
D5107	1-809-070-11	DIODE	AK04-V2	
D5108	8-719-010-34	DIODE	UZ-4.7BSC	
D5109	8-719-109-89	DIODE	RD5.6ES-B2	
D5110	8-719-981-94	DIODE	MTZJ-T-77-2.7A	
D5111	8-719-912-20	DIODE	1SS120	
D5112	8-719-912-20	DIODE	1SS120	
D5132	8-719-921-89	DIODE	MTZJ-13C	
		< FUSE >		
⚠F5001	1-576-262-11	FUSE 125V 2A		
		< IC >		
IC511	8-759-820-97	IC L5431		
IC512	1-808-795-11	IC SI3120CA		
IC513	1-808-795-11	IC SI3120CA		
		< COIL >		
⚠L5001	1-424-623-11	COIL, LINE FILTER		
L5101	1-412-464-11	INDUCTOR, COIL 10uH		
L5103	1-543-699-11	CORE		
		< PROTECTER >		
⚠PR511	1-576-237-11	PROTECTER, CIRCUIT		
		< TRANSISTOR >		
Q5001	1-809-604-11	TRANSISTOR	2SK1691-FA13	
Q5002	1-809-602-11	TRANSISTOR	2SC2274-F-AA	
Q5003	8-729-201-53	TRANSISTOR	2SA1015-GR	

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Ref. No.	Part No.	Description	Remark
Q5004	1-809-602-11	TRANSISTOR 2SC2274-F-AA	
Q5101	8-729-140-96	TRANSISTOR KSC1008	
Q5102	8-729-905-67	TRANSISTOR 2SD1944-K	
Q5109	8-729-900-89	TRANSISTOR DTC144ES	
Q5110	8-729-900-89	TRANSISTOR DTC144ES	
		< RESISTOR >	
R5001	1-202-724-00	SOLID 2.7M 10% 1/2W	
R5005	1-220-374-11	OXIDE-MT 0.47 3W	
R5010	1-220-375-11	OXIDE-MT 15K 3W	
		< TRANSFORMER >	
⚠T5001	1-692-048-11	SWITCH, TRANSFORMER	

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Ref. No.	Part No.	Description	Remark
*	A-6756-918-A	TB-1 BOARD, COMPLETE *********************	
*	3-946-543-01	HOLDER	
*	3-951-926-01	SHEET, DEC BACK	
*	3-952-156-01	BRACKET, TERMINAL	
	7-685-648-79	SCREW +BTP 3X12 TYPE2 N-S	
	7-685-647-79	SCREW +BVTP 3X10 TYPE2 SLIT	
		< CAPACITOR >	
C8501	1-161-063-00	CERAMIC 0.1uF 10% 50V	
C8502	1-126-157-11	ELECT 10uF 20% 16V	
C8503	1-162-282-31	CERAMIC 100PF 10% 50V	
C8504	1-126-157-11	ELECT 10uF 20% 16V	
C8505	1-126-154-11	ELECT 47uF 20% 6.3V	
C8506	1-126-157-11	ELECT 10uF 20% 16V	
C8508	1-161-039-00	CERAMIC 0.001uF 10% 50V	
C8509	1-161-039-00	CERAMIC 0.001uF 10% 50V	
C8511	1-161-039-00	CERAMIC 0.001uF 10% 50V	
C8512	1-161-039-00	CERAMIC 0.001uF 10% 50V	
C8513	1-161-039-00	CERAMIC 0.001uF 10% 50V	
C8514	1-161-039-00	CERAMIC 0.001uF 10% 50V	
C8515	1-161-039-00	CERAMIC 0.001uF 10% 50V	
C8516	1-161-061-11	CERAMIC 0.068uF 10% 50V	
C8517	1-161-063-00	CERAMIC 0.1uF 10% 50V	
C8518	1-124-455-00	ELECT 100uF 20% 16V	
		< DIODE >	
D8501	1-809-605-11	DIODE MTZ13C-T-77	
D8502	1-809-605-11	DIODE MTZ13C-T-77	
D8503	1-809-605-11	DIODE MTZ13C-T-77	
D8504	1-809-605-11	DIODE MTZ13C-T-77	
D8505	1-809-605-11	DIODE MTZ13C-T-77	
D8506	1-809-605-11	DIODE MTZ13C-T-77	
D8507	1-809-605-11	DIODE MTZ13C-T-77	

Ref. No.	Part No.	Description	Remark
D8508	1-809-605-11	DIODE MTZ13C-T-77	
D8509	1-809-605-11	DIODE MTZ13C-T-77	
D8511	8-719-911-19	DIODE 1SS119	
D8512	8-719-911-19	DIODE 1SS119	
D8513	8-719-911-19	DIODE 1SS119	
D8514	8-719-911-19	DIODE 1SS119	
D8515	8-719-911-19	DIODE 1SS119	
D8516	8-719-911-19	DIODE 1SS119	
D8517	8-719-911-19	DIODE 1SS119	
D8518	8-719-911-19	DIODE 1SS119	
D8519	8-719-911-19	DIODE 1SS119	
D8520	8-719-911-19	DIODE 1SS119	
D8521	8-719-911-19	DIODE 1SS119	
D8522	8-719-911-19	DIODE 1SS119	
D8523	8-719-911-19	DIODE 1SS119	
D8524	8-719-911-19	DIODE 1SS119	
D8525	8-719-911-19	DIODE 1SS119	
D8526	8-719-911-19	DIODE 1SS119	
D8527	8-719-911-19	DIODE 1SS119	
D8528	8-719-911-19	DIODE 1SS119	
D8529	8-719-911-19	DIODE 1SS119	
D8530	8-719-911-19	DIODE 1SS119	
D8531	8-719-911-19	DIODE 1SS119	
D8532	8-719-911-19	DIODE 1SS119	
D8533	8-719-911-19	DIODE 1SS119	
D8534	8-719-911-19	DIODE 1SS119	
		< IC >	
IC851	8-759-820-41	IC LA6458SK	
IC852	1-809-585-11	IC LB1475	
		< JACK >	
JK851	1-750-560-11	SOCKET, BNC (VIDEO IN)	
JK852	1-750-560-11	SOCKET, BNC (VIDEO OUT)	
JK853	1-580-129-11	SOCKET (RCA) (AUDIO OUT)	
JK854	1-580-129-11	SOCKET (RCA) (AUDIO IN)	
JK855	1-695-522-11	JACK, MICROPHONE (MIC IN)	
JK856	1-750-561-11	JACK, HEADPHONE (REMOTE)	
		< COIL >	
L8501	1-410-521-11	INDUCTOR 100uH	

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Ref. No.	Part No.	Description	Remark
*	A-6756-916-A	TM-1 BOARD, COMPLETE *********************	
*	3-946-542-01	HOLDER	
*	3-946-545-01	HOLDER	
		< INDICATOR TUBE >	
A7101	1-519-675-11	INDICATOR TUBE, FLUORESCENT	
		< CAPACITOR >	
C7101	1-126-154-11	ELECT 47uF 20% 6.3V	
C7102	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C7103	1-126-154-11	ELECT 47uF 20% 6.3V	
C7104	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C7105	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C7106	1-126-153-11	ELECT 22uF 20% 6.3V	
C7107	1-161-379-00	CERAMIC 0.01uF 20% 25V	
C7108	1-102-958-00	CERAMIC 20PF 5% 50V	
C7109	1-102-958-00	CERAMIC 20PF 5% 50V	
		< DIODE >	
D7101	8-719-911-19	DIODE 1SS119	
D7102	8-719-911-19	DIODE 1SS119	
D7103	8-719-911-19	DIODE 1SS119	
D7104	8-719-911-19	DIODE 1SS119	
D7105	8-719-911-19	DIODE 1SS119	
D7106	8-719-911-19	DIODE 1SS119	
D7108	8-719-911-19	DIODE 1SS119	
D7109	8-719-911-19	DIODE 1SS119	
D7110	8-719-911-19	DIODE 1SS119	
D7111	8-719-911-19	DIODE 1SS119	
		< IC >	
IC711	1-809-996-11	IC M50957-281SP	
IC712	1-808-855-11	IC M6M80021P	
IC713	1-809-383-11	IC MN1380-L	
		< RESISTOR >	
R7104	1-202-731-00	SOLID 10M 10% 1/2W	
		< COMPOSITION CIRCUIT BLOCK >	
RB711	1-239-256-11	R-NETWORK 10KX4	
		< SWITCH >	
S7101	1-692-216-11	SWITCH, PUSH (■ STOP)	
S7102	1-692-392-11	SWITCH, PUSH (FF)	
S7103	1-692-216-11	SWITCH, PUSH (● REC)	
S7104	1-692-392-11	SWITCH, PUSH (REW)	
S7105	1-692-392-11	SWITCH, PUSH (PLAY)	
S7106	1-692-392-11	SWITCH, PUSH (REV)	
S7107	1-692-392-11	SWITCH, PUSH (PAUSE/AL SCAN)	
S7108	1-692-392-11	SWITCH, PUSH (AL (RESET))	
S7109	1-692-392-11	SWITCH, PUSH (PAGE)	
S7110	1-692-392-11	SWITCH, PUSH (ADV/AUDIO ON)	
S7111	1-692-392-11	SWITCH, PUSH (RESET (COUNTER))	
S7112	1-692-392-11	SWITCH, PUSH (MEMORY (COUNTER))	
S7113	1-692-392-11	SWITCH, PUSH (SHIFT →)	
S7114	1-692-392-11	SWITCH, PUSH (SHIFT ↓)	
S7115	1-692-392-11	SWITCH, PUSH (+ (REC/PLAY SPEED))	
S7116	1-692-392-11	SWITCH, PUSH (- (REC/PLAY SPEED))	
S7117	1-692-392-11	SWITCH, PUSH (T/D (RESET))	
		< VIBRATOR >	
XF711	1-577-683-11	RESONATOR, CERAMIC	
XF712	1-579-220-11	CRYSTAL, OSC (32KHz)	

****

Ref. No.	Part No.	Description	Remark
*	A-6756-868-A	TM-2 BOARD, COMPLETE *********************	
		< CAPACITOR >	
C7201	1-126-157-11	ELECT 10uF 20% 16V	
		< DIODE >	
D7201	8-719-911-19	DIODE 1SS119	
D7202	8-719-911-19	DIODE 1SS119	
D7203	8-719-911-19	DIODE 1SS119	
D7204	1-809-606-11	LED EBR3668S	
D7205	1-809-606-11	LED EBR3668S	
		< TRANSISTOR >	
Q7201	8-729-900-80	TRANSISTOR DTC114ES	
		< SWITCH >	
S7201	1-692-216-11	SWITCH, PUSH (⏏ EJECT)	
S7202	1-692-216-11	SWITCH, PUSH (POWER)	
S7203	1-692-392-11	SWITCH, PUSH (PL RESET)	
S7204	1-572-416-11	SLIDE SWITCH (REPEAT REC)	
S7205	1-572-416-11	SLIDE SWITCH (TIMER REC)	
S7206	1-572-450-11	SWITCH, SLIDE (ALARM DURATION)	
		< VARIABLE RESISTOR >	
VR721	1-241-641-11	VR ROTARY 1K (SHARPNESS)	
VR722	1-223-391-11	VR ROTARY 500K (NOMAL)	
VR723	1-223-391-11	VR ROTARY 500K (SLOW)	
VR724	1-241-809-11	VR ROTARY 100K (STILL ADJUST)	

****

Ref. No.	Part No.	Description			Remark
*	A-6756-917-A	VP-1 BOARD, COMPLETE			

****

< CAPACITOR >

Ref. No.	Part No.	Description			Remark
C1801	1-161-055-00	CERAMIC	0.022uF	10%	50V
C1802	1-161-063-00	CERAMIC	0.1uF	10%	50V
C1803	1-161-063-00	CERAMIC	0.1uF	10%	50V
C1804	1-161-055-00	CERAMIC	0.022uF	10%	50V
C1805	1-161-055-00	CERAMIC	0.022uF	10%	50V
C1806	1-161-063-00	CERAMIC	0.1uF	10%	50V
C1807	1-161-063-00	CERAMIC	0.1uF	10%	50V
C1808	1-161-055-00	CERAMIC	0.022uF	10%	50V
C1809	1-162-294-31	CERAMIC	0.001uF	10%	50V
C1810	1-161-494-00	CERAMIC	0.022uF		25V
C1811	1-162-294-31	CERAMIC	0.001uF	10%	50V
C1812	1-164-073-11	CERAMIC	100PF	10%	50V
C1813	1-161-055-00	CERAMIC	0.022uF	10%	50V
C1814	1-126-301-11	ELECT	1uF	20%	50V
C1815	1-161-494-00	CERAMIC	0.022uF		25V
C1816	1-126-155-11	ELECT	100uF	20%	6.3V
C1817	1-161-494-00	CERAMIC	0.022uF		25V
C1819	1-101-880-00	CERAMIC	47PF	5%	50V
C1820	1-161-055-00	CERAMIC	0.022uF	10%	50V
C1821	1-164-064-11	CERAMIC	56PF	5%	50V
C1822	1-164-060-11	CERAMIC	39PF	5%	50V
C1823	1-162-219-11	CERAMIC	68PF	5%	50V
C1824	1-162-211-31	CERAMIC	33PF	5%	50V
C1825	1-161-494-00	CERAMIC	0.022uF		25V
C1826	1-164-077-11	CERAMIC	220PF	10%	50V
C1827	1-162-816-11	CERAMIC CHIP	180PF	5%	50V
C1828	1-161-055-00	CERAMIC	0.022uF	10%	50V
C1829	1-161-379-00	CERAMIC	0.01uF	20%	25V
C1830	1-164-076-11	CERAMIC	180PF	10%	50V
C1831	1-164-078-11	CERAMIC	270PF	10%	50V
C1832	1-161-379-00	CERAMIC	0.01uF	20%	25V
C1833	1-124-455-00	ELECT	100uF	20%	16V
C1834	1-161-063-00	CERAMIC	0.1uF	10%	50V
C1835	1-161-063-00	CERAMIC	0.1uF	10%	50V
C1836	1-161-063-00	CERAMIC	0.1uF	10%	50V
C1837	1-126-154-11	ELECT	47uF	20%	6.3V
C1838	1-161-494-00	CERAMIC	0.022uF		25V
C1840	1-161-494-00	CERAMIC	0.022uF		25V
C1841	1-127-556-11	ELECT	6.8uF	20%	16V
C1842	1-162-217-11	CERAMIC	56PF	5%	50V
C1844	1-164-829-11	CERAMIC	10uF		10V

< DIODE >

Ref. No.	Part No.	Description
D1801	8-719-110-14	DIODE RD9.1ES-B3
D1802	8-719-911-19	DIODE 1SS119

< IC >

Ref. No.	Part No.	Description
IC181	1-809-583-11	IC AN3383K

< COIL >

Ref. No.	Part No.	Description	Remark
L1801	1-410-521-11	INDUCTOR 100uH	
L1804	1-410-517-11	INDUCTOR 47uH	
L1807	1-410-490-11	INDUCTOR 470uH	
L1808	1-410-509-11	INDUCTOR 10uH	
L1809	1-410-513-11	INDUCTOR 22uH	
L1810	1-412-463-11	CHOKE, HF 330uH	
L1811	1-410-490-11	INDUCTOR 470uH	
L1812	1-410-525-11	INDUCTOR 220uH	
L1813	1-410-522-11	INDUCTOR 120uH	
L1814	1-410-511-11	INDUCTOR 15uH	

< TRANSISTOR >

Ref. No.	Part No.	Description	
Q1802	8-729-266-83	TRANSISTOR	2SC2668
Q1803	8-729-119-76	TRANSISTOR	2SA1175-HFE
Q1804	8-729-266-83	TRANSISTOR	2SC2668
Q1806	8-729-266-83	TRANSISTOR	2SC2668
Q1809	8-729-119-78	TRANSISTOR	2SC2785-HFE
Q1810	8-729-119-78	TRANSISTOR	2SC2785-HFE
Q1811	8-729-119-76	TRANSISTOR	2SA1175-HFE
Q1812	8-729-119-76	TRANSISTOR	2SA1175-HFE
Q1821	8-729-900-89	TRANSISTOR	DTC144ES
Q1822	8-729-900-89	TRANSISTOR	DTC144ES
Q1823	8-729-900-89	TRANSISTOR	DTC144ES
Q1824	8-729-900-89	TRANSISTOR	DTC144ES

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description
VR181	1-230-504-11	RES, ADJ, METAL 220
VR182	1-241-984-11	VR SEMI 100B

****

MISCELLANEOUS

****

Ref. No.	Part No.	Description
110	1-808-710-11	PHOTO TRANSISTOR
* 223	1-461-017-11	ROTOR
225	1-462-284-11	STATOR
276	1-572-383-11	SWITCH, ROTARY

****

ACCESSORIES & PACKING MATERIALS

****

Ref. No.	Part No.	Description
⚠	1-690-826-11	CORD, POWER (UL)
	3-755-905-31	MANUAL, INSTRUCTION (ENGLISH, FRENCH)
*	3-946-551-01	CUSHION (FRONT), INNER
*	3-946-552-01	CUSHION (BACK), INNER
*	3-952-155-01	INDIVIDUAL CARTON

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

HARDWARE LIST

Ref.No.	Part No.	Description	Remark
#1	7-621-732-08	SET-SCT, HEX. 2X3 FLAT POINT	
#2	7-621-775-20	SCREW +B 2.6X5	
#3	7-624-105-04	STOP RING 2.3, TYPE -E	
#4	7-682-547-09	SCREW +B 3X6	
#5	7-685-131-19	SCREW +BTP 2.6X4 TYPE2 N-S	
#6	7-685-534-19	SCREW +BTP 2.6X8 TYPE2 N-S	
#7	7-685-647-79	SCREW +BTP 3X10 TYPE2 N-S	
#9	7-685-661-19	SCREW +BVTP 4X12 TYPE2 N-S	
#10	7-685-133-19	SCREW, TOTSU PTP 2.6X6 TYPE2	
#11	7-685-645-79	SCREW +BTP 3X6 TYPE2 N-S	
#12	7-685-648-79	SCREW +BTP 3X12 TYPE2 N-S	
#13	7-685-107-01	SCREW (2.3X12), +PTP	
#14	7-684-023-04	NUT (DIA.3), SPECIAL	
#15	7-682-903-01	SCREW (3X4), +PWH	
#16	7-628-253-20	SCREW (2.3X6), +PSW	
#17	7-682-648-09	SCREW (3X8), +PW	

SECTION 7
MECHANISM ADJUSTMENTS

7-1. OPERATING THE MECHANISM WITH NO CASSETTE INSERTED (See Fig. 7-1-1.)

1) Attach black vinyl tape to the T. END and T. TOP sensors to prevent light from entering.
2) Push the TRAY LOCK LEVER in the direction of the arrow to maintain the unlocked condition. Release the lever just before the TRAY starts moving down.
3) In this condition, operation is possible in every mode. However, the following procedures are necessary to operate the unit in the REC, REW and R-SEARCH modes.

REC mode : Push the SAFETY SW LEVER to turn the SAFETY SWITCH (Erasure Prevention Switch) ON, then press the REC button. If the SAFETY SWITCH is not turned ON, the unit will enter the EJECT mode.

REW/R-SEARCH : After pressing the REW button, turn the TAKE-UP REEL ASS'Y by hand. Otherwise, the reel sensor will operate, setting the INITIAL mode after 2 to 3 seconds.

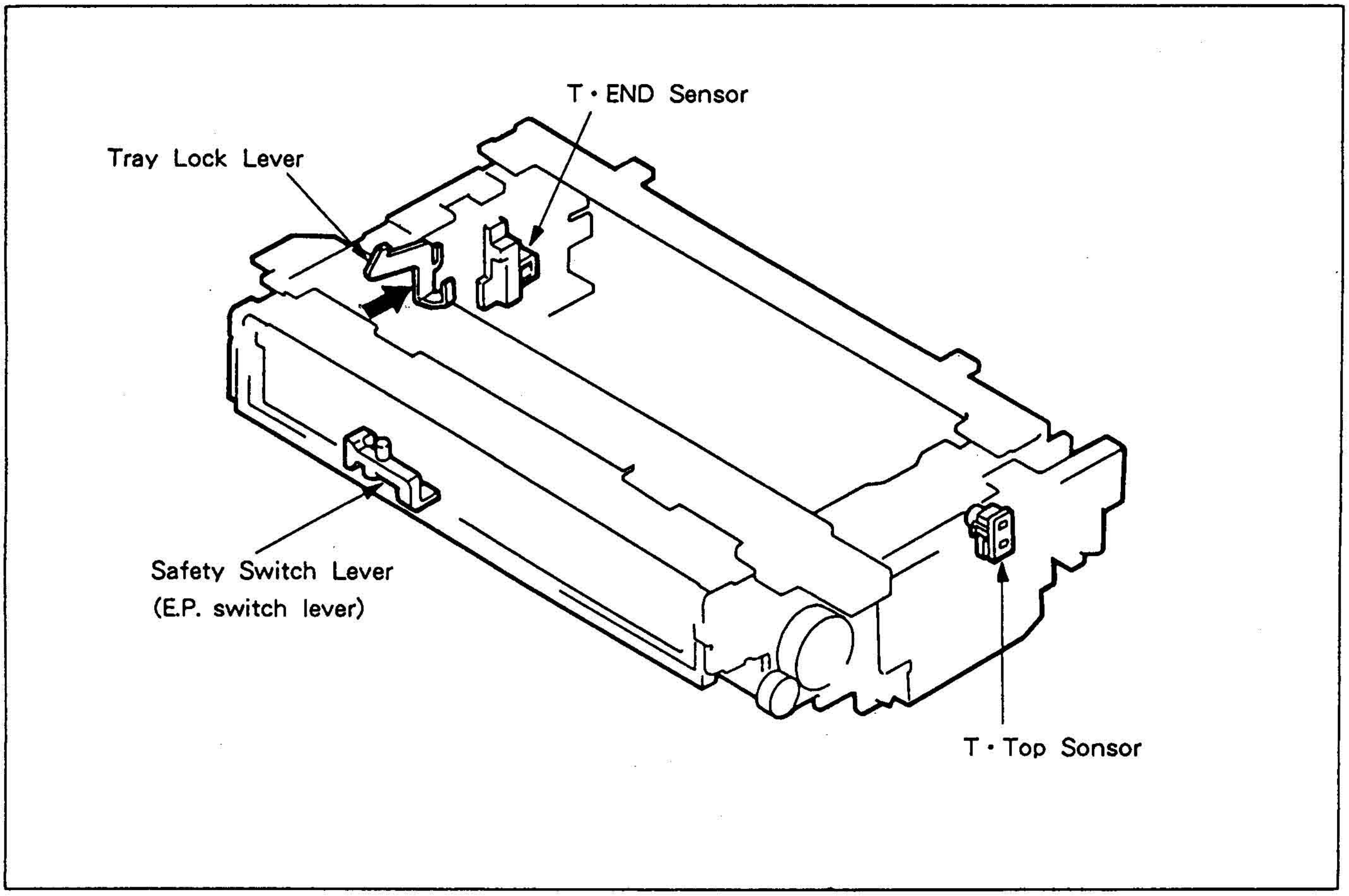


Fig. 7-1-1. Preparations for Adjustment

7-2. REEL TABLE HEIGHT ADJUSTMENT AND TORQUE CHECK

7-2-1.Reel Table Height (See Fig. 7-2-1.)

If the SUPPLY REEL ASS'Y or the TAKE-UP REEL ASS'Y is raplaced, it will be necessary to adjust the REEL TABLE height.

(1) Remove the COMPL CASSETTE MECHANISM as instructed in P.101.
(2) Attach the master plane (H-7099-279-H) and reel disc height jig (H-7099-038-H) in the direction of the arrows.
(3) Confirm that, when the gauge stops, the REEL TABLEs are not in contact with surface A of the plate and side of the REEL TABLEs are in contact with surface B.
(4) If the REEL TABLE is in contact with surface A, remove a spacer and check again.
(5) If the REEL TABLE is not in contact with surface B, add a spacer and check again.
(6) Remove the master plane.
(7) Set the EJECT mode with the mode selector.
(8) Mount the COMPL CASSETTE MECHANISM as instructed in P.101.

Note:

- Adjust the reel table height by adding or removing spacers(0.13t, 0.25t, 0.3t, 0.4t and 0.5t)as appropriate so that the height meets the specifications. Use the same method for both the TAKE-UP REEL TABLE and the SUPPLY REEL TABLE.
  (The 0.5t washer is included as the standard washer for the SUPPLY REEL ASS'Y. The 0.4t washer is included as the standard washer for the TAKE-UP REEL ASS'Y.)
- If the height of the reel table is not within the specified value, the tape edge might be damaged as a result, or the tape path adjustment might not be possible to make.

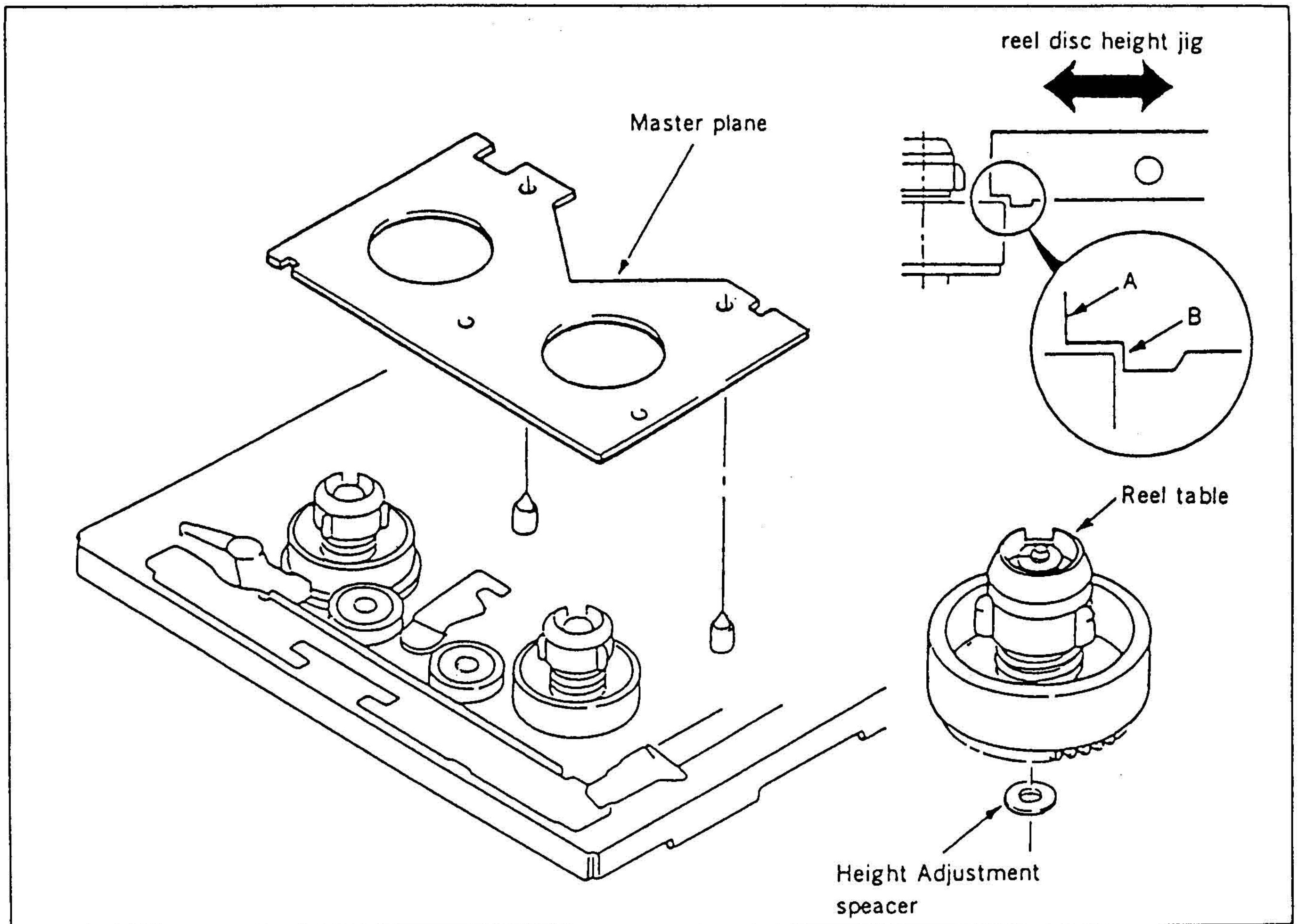


Fig. 7-2-1. Reel Table Height Adjustment

7-2-2.Torque Check (See Fig. 7-2-2.)

1) Set the unit to operating condition without a cassette inserted as instructed in 7-1.
2) Measure the SUPPLY REEL TABLE torque in the REW mode, and confirm that it is 750gcm or more. Perform this measurement keeping the torque gauge in a fixed position with your hand (locked torque).
3) Measure the TAKE-UP REEL TABLE torque in the F.FWD mode, and confirm that it is 600gcm or more (locked torque).
4) Measure the TAKE-UP REEL TABLE torque in the playback mode (SP tape speed), and confirm that it is within 80 through 140gcm (locked torque).
5) Measure the SUPPLY REEL TABLE torque in the REV (F-SEARCH) mode, and confirm that it is within 150 through 240 gcm (locked torque).
6) After confirming that torque readings are within the specifications for each mode, check the following :
    - ⓐ Dirt on the capstan motor and the REEL PULLEY groove.
    - ⓑ Deterioration of the REEL DRIVE BELT.
    - ⓒ Deterioration of the FRICTION GEAR ASS'Y felt (torque during playback).
    - ⓓ Wear and damage of the COMPL CLUTCH MECHANISM and the reel drive system gears.

Note1 : Items ⓑ, ⓒ and ⓓ require replacement if found defective.

Note2 : The measured value of torque during FF and REW represents the value 2 seconds after starting.

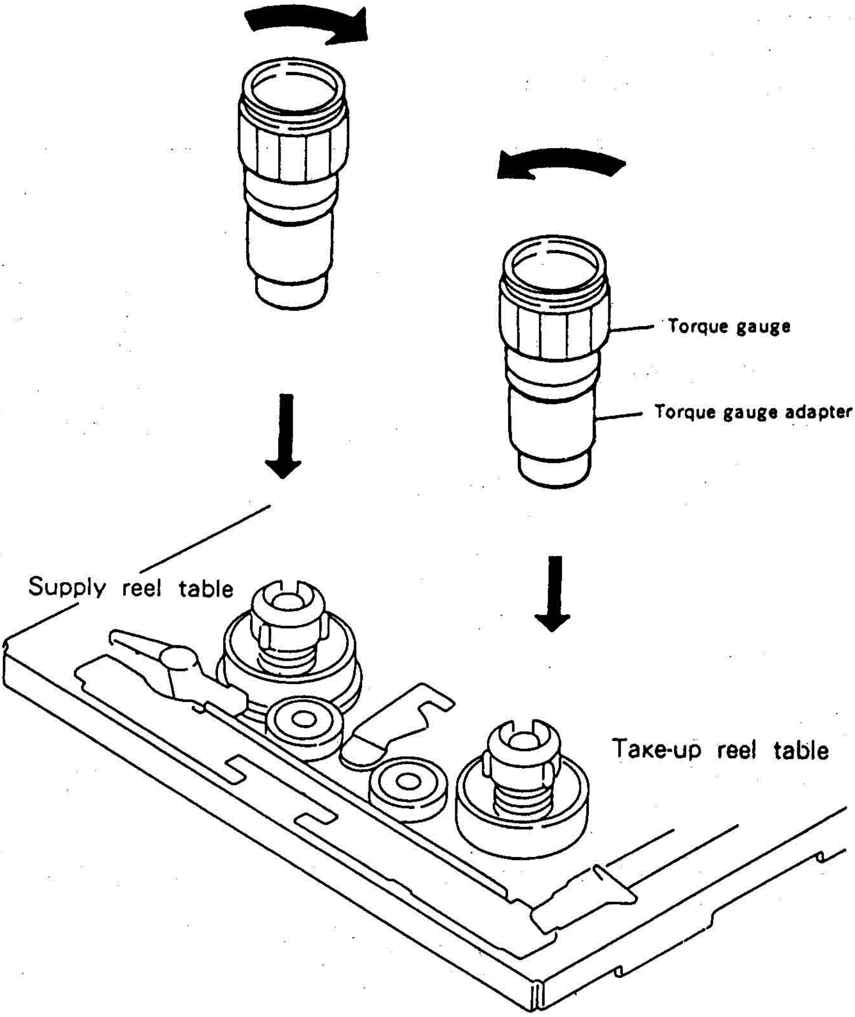


Fig. 7-2-2. Checking REW/FF/PLAY Torque

7-3. TENSION POLE (BACK TENSION GUIDE) POSITION ADJUSTMENT AND BACK TENSION TORQUE CHECK

7-3-1.Tension Pole (Back Tension Guide) Position Adjustment (See Fig. 7-3-1.)

1) Remove the COMPL CASSETTE MECHANISM as instructed in P.101.
2) Set the PLAY mode with the mode selector (VHJ-0050)
3) Confirm that the space between the end of chassis and the Tension arm is from 4mm to 6mm.
4) In case the tension pole is not withim 4-6mm, adjust it by loosening the screw ④ a little and changing the mounting position of the BAND HOLDER ⑤ in the direction of the arrow Ⓐ.
5) Set the EJECT mode with the mode selector.
6) Mount the COMPL CASSETTE MECHANISM as instructed in P.101.
7) Confirm that back tension torque is within 42± 5gcm, as instructed in 7-3-2.below.

7-3-2.Back Tension Torque Chack (See Fig. 7-3-1.)

1) Attach the cassette torquemeter (VHJ-0016) and set the PLAY mode.
2) Confirm that back tension torque is within 50 ± 10gcm.
3) In case back tension torque dose not meet the above specification, proceed as follows:

ⓐ Clean the portion where the brake band (BAND HOLDER ASS'Y) ⑦ of the SUPPLY REEL ASS'Y ⑥ makes contact.

ⓑ Confirm that the brake band of the BAND HOLDER ASS'Y ⑦ does not make wear and that it is clean. If wear or dirt is found, replace the band holder assembly ⑦ as instructed in P.104.

ⓒ Raplace the TENSION LEVER ASS'Y SPRING COIL ⑧.

Note : Always follow procedures in 7-3-1. Tension Pole Position Adjustment after performing ⓐ, ⓑ and ⓒ.

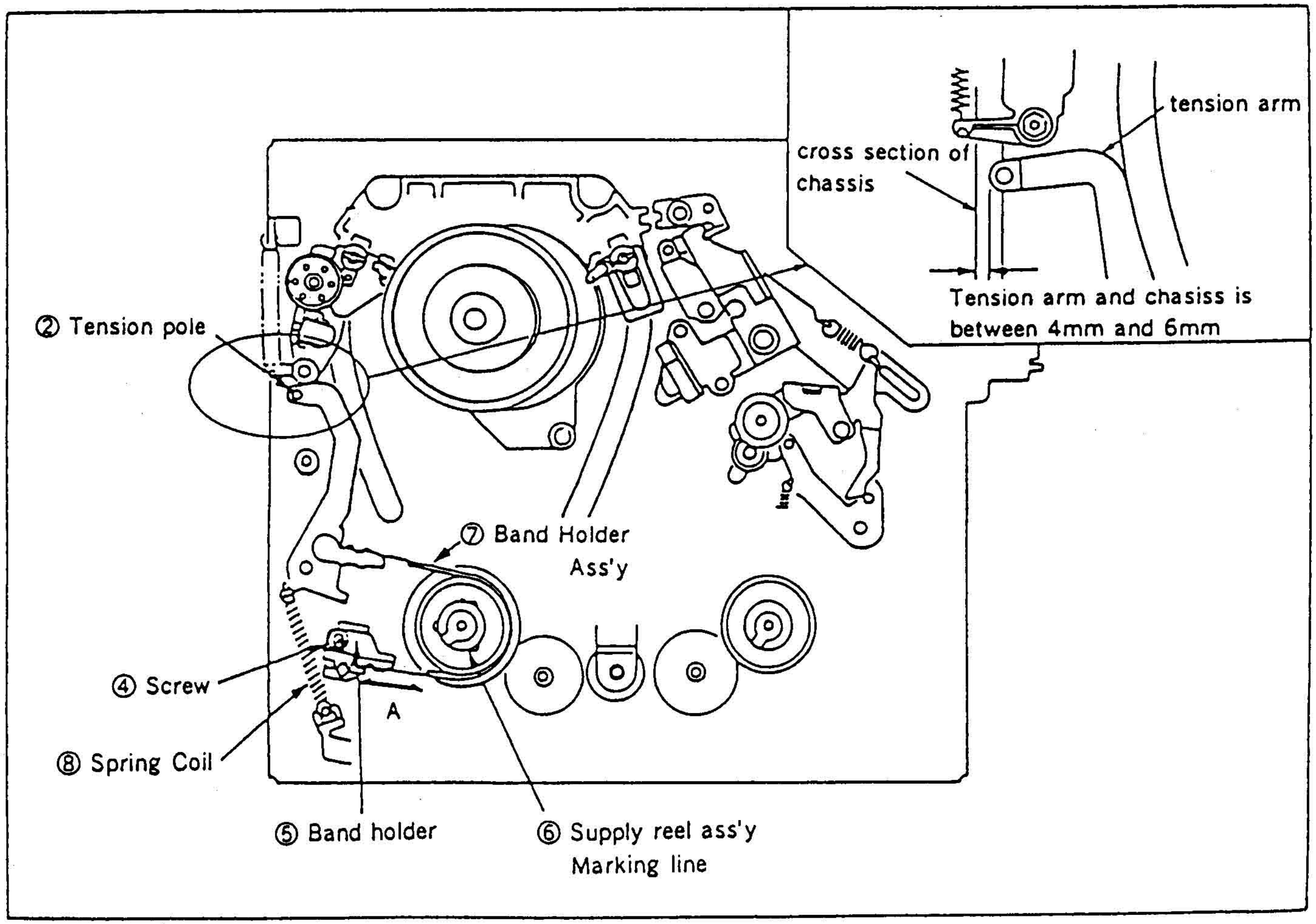

tension arm
cross section of chassis
Tension arm and chasiss is between 4mm and 6mm
② Tension pole
⑦ Band Holder Ass'y
④ Screw
A
⑧ Spring Coil
⑤ Band holder
⑥ Supply reel ass'y
Marking line

Fig. 7-3-1. Tension Pole Positioning Adjustment

7-4. TAPE PATH ADJUSTMENT

The tape path mechanism is precisely adjusted at the factory. Normally no readjustment is required, but checking and/or adjustment is necessary when parts of the tape path mechanism among those shown in the figure below (See Fig. 7-4-1.) have been removed or replaced after a long period of use.
This operation consists of adjusting the various guides so that the tape drawn out from the supply reel runs smoothly along the DRUM (CYLINDER) lead surface. A way of grasping the tape path condition by electronic means is monitoring the video head output envelope waveform with an oscilloscope. However, the fact that visual observation is essential in order to know whether the tape is running through the various guides in a smooth and natural way should be kept in mind when checking and adjusting.
Also remember that the position of tape guides is not greatly affected by the replacement of the UPPER DRUM (UPPER CYLINDER) or the COMPL DRUM (COMPL CYLINDER), provided that it is correctly performed, and that only the replaced parts should be adjusted after replacing a tape guide or COMPL HEAD BRACKET, since the position of the other tape guides shall not change considerably.

7-4-1. Preparations for Adjustment

(1) Clean the tape transport surfaces (See Fig. 7-4-1.).

(2) Connect the oscilloscope. Connect the channel 1 probe to the envelope waveform test point, and the channel 2 probe to the SW25 (RF SW P) test point. During adjustment, apply a trigger to the low side of the SW25 (RF SW P) in order to monitor the waveform output from channel 1 of the video head.

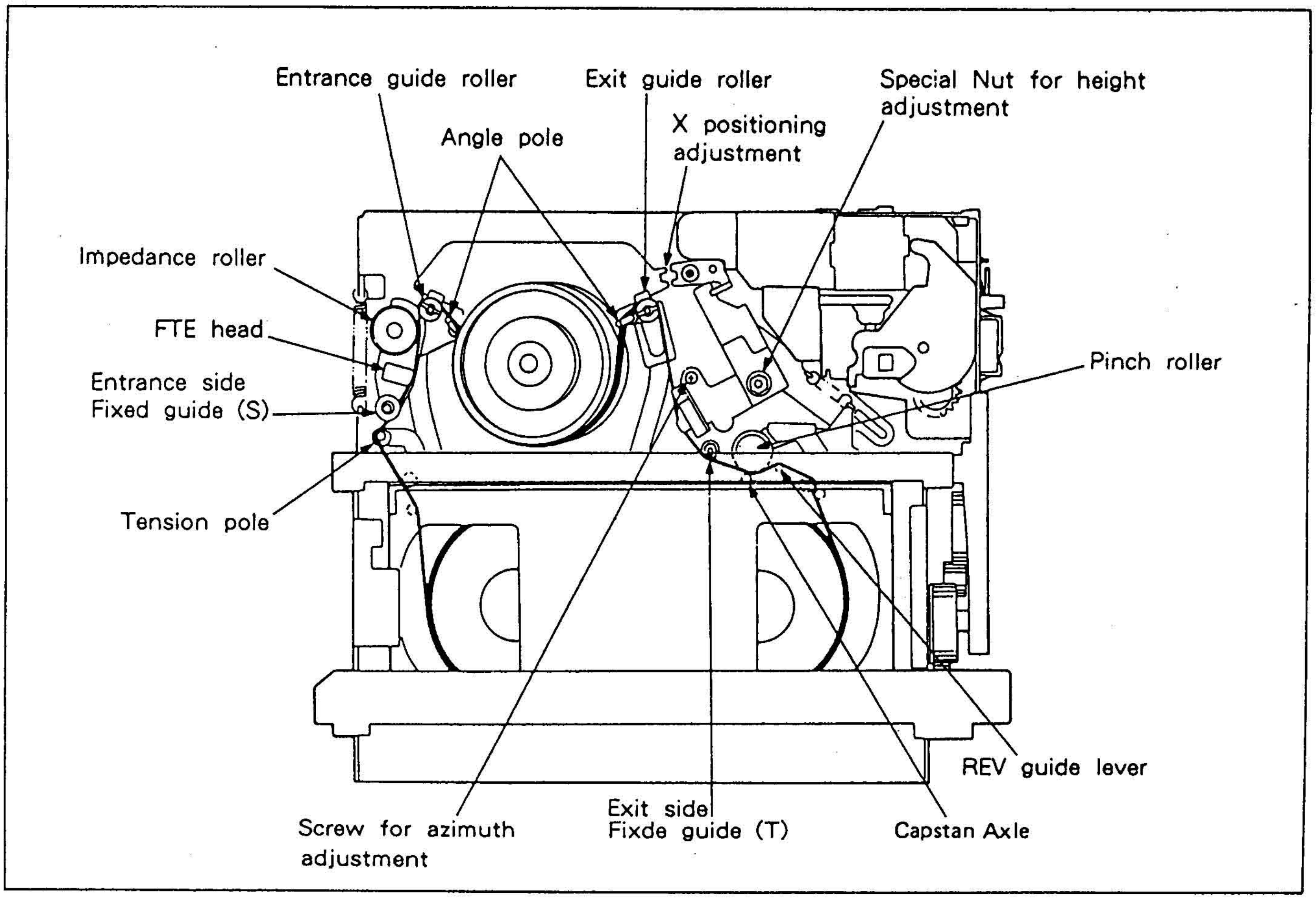
Note : Since oscilloscope connection points differ according to the model, refer to the "Test Point for Tape Path Adjustment" allocation figure in the electric circuit adjustment section of the service manual book.

(3) Use a dentist's mirror for visual observation of tape path condition.

(4) Use an eccentric driver (VHJ - 0003) for adjustment of the guide rollers.

(5) When adjusting height of the fixed guide, guide rollers or COMPL head bracket, turn the special nut or the upper flange clockwise to push the tape downward, and counterclockwise to make the tape rise up.

(6) Do not use the damaged cassette tapes for tape path adjustment.



Entrance guide roller
Exit guide roller
Special Nut for height adjustment
Angle pole
X positioning adjustment
Impedance roller
FTE head
Entrance side Fixed guide (S)
Tension pole
Pinch roller
REV guide lever
Screw for azimuth adjustment
Exit side Fixde guide (T)
Capstan Axle

Fig. 7-4-1. Preparation for Adjustment

7-4-2. Adjustment by Visual Observation after Guide Roller, COMPL Head Bracket Replacement

Perform this adjustment after removing or replacing any of the above parts. Only for the replaced or removed parts, play back an alignment tape (NTSC HiFi 400Hz) beforehand and adjust height by visual observation.

(1) Fixing Guide (See Fig. 7-4-2.)
Adjust so that the upper edge of the tape and the upper flange of the fixing guide, and the lower edge of the tape and the lower flange of the fixing guide do not touch. Also adjust so that clearances A and B become equal.

(2) Guide Rollers (See Fig. 7-4-3.)
The tape should not be curled by the guide roller upper and lower flanges. It should also run smoothly, without moving up and down on the DRUM (CYLINDER) lead surface.

Note : An excessive guide roller pressure may cause tape damage.

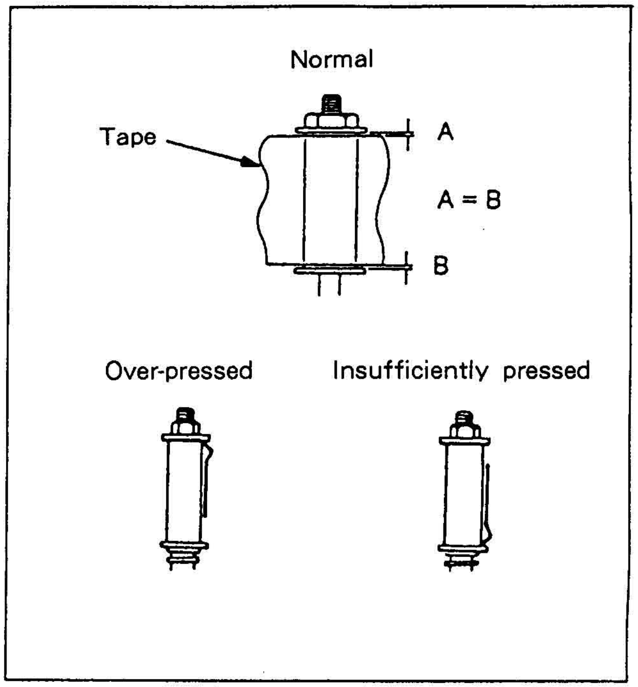

Normal
Tape
A
A = B
B
Over-pressed
Insufficiently pressed

Fig. 7-4-2. Temporary Adjustment of Fixing Guide

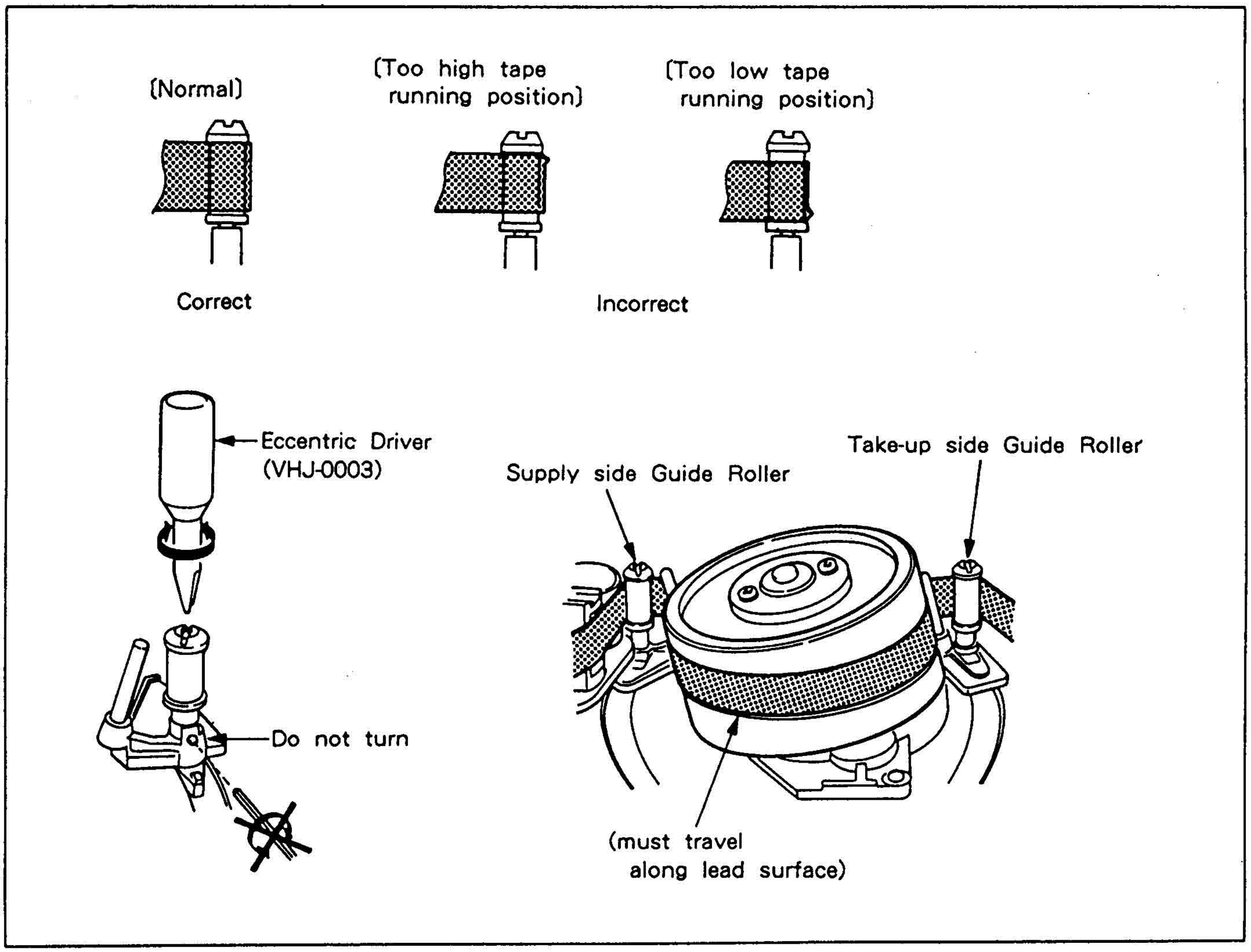

(Normal)
(Too high tape running position)
(Too low tape running position)
Correct
Incorrect
Eccentric Driver (VHJ-0003)
Do not turn
Supply side Guide Roller
Take-up side Guide Roller
(must travel along lead surface)

Fig. 7-4-3. (2) Pre-set for Guide Roller

(3) COMPL Head Bracket (ACE Head) (See Fig. 7-4-4.)

Adjust the special nut so that the tape edge runs between the audio head upper end and the control head lower end. Gaps A and B should be of about the same width. Since at this point it is only required that the control signal is picked up and the servo circuit works normally, no adjusting screws except the COMPL head bracket special nut shouid be touched.

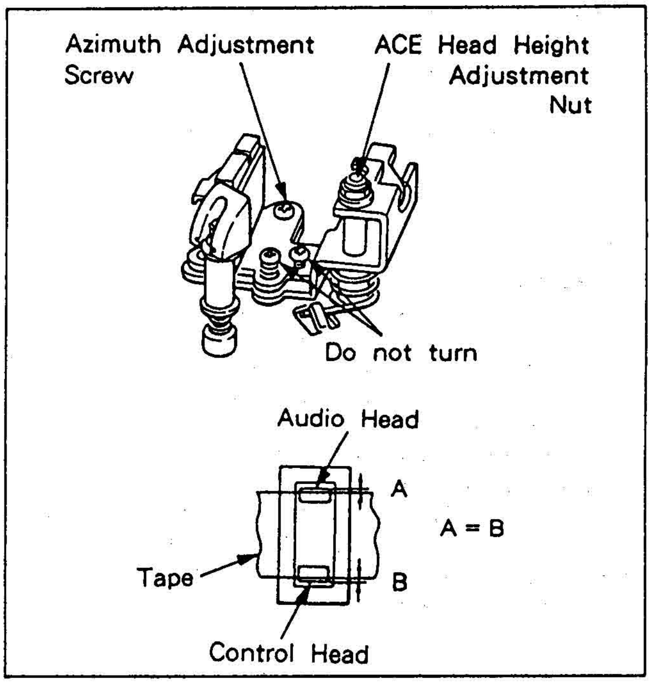

Azimuth Adjustment Screw
ACE Head Height Adjustment Nut
Do not turn
Audio Head
A
A = B
Tape
B
Control Head

Fig. 7-4-4. (3) Pre-set for Compl Head Bracket

7-4-3.Tape Path Check of Entrance Side Fixed Guide (S)(See Fig. 7-4-5.)

The fixed guide (S) of the entrance side does not require adjustment in this mechanism.

Confirm that the lower edge portion of the tape is running along the lower flange of the entrance side fixed guide (S).

The tape should not be curled by the entrance side fixed guide (S) upper and lower flanges.

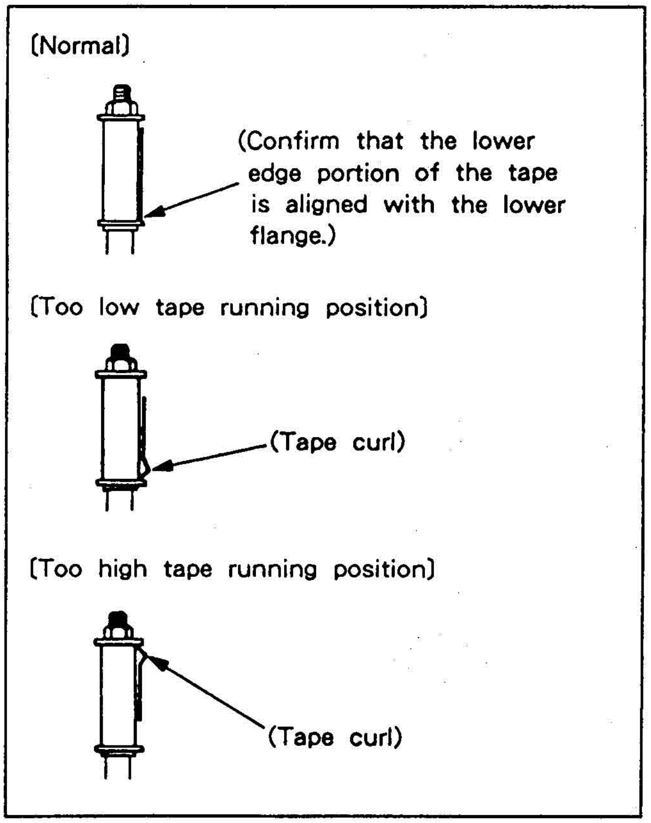

(Normal)
(Confirm that the lower edge portion of the tape is aligned with the lower flange.)
(Too low tape running position)
(Tape curl)
(Too high tape running position)
(Tape curl)

Fig. 7-4-5. Fixed Guide(S)

7-4-4.Guide Roller Adjustment (See Fig. 7-4-6.)

1) Play back the alignment tape (NTSC HiFi 400Hz), press the tracking control key and adjust the envelope waveform to the maximum level.
2) Loosen the entrance and exit guide rollers by rotating them counterclockwise, then rotate them clockwise alternately until they are fastened and a flat video output waveform is obtained.
3) Confirm that the envelope waveform is not deformed, and check visually that no curling occurs at the guide roller upper and lower flanges.
4) Press the tracking control key and set the envelope waveform level to approx. 50% of the maximum. In this condition, confirm whether the envelope waveform is flat. It will not, showing valleys or peaks at the first half (entrance) or second half (exit), if the guide roller pressure is excessive or insufficient.
In case there is unevenness in the first half (entrance), adjust the entrance side guide roller. If the second half (exit) shows trouble, adjust finely the exit side guide roller.

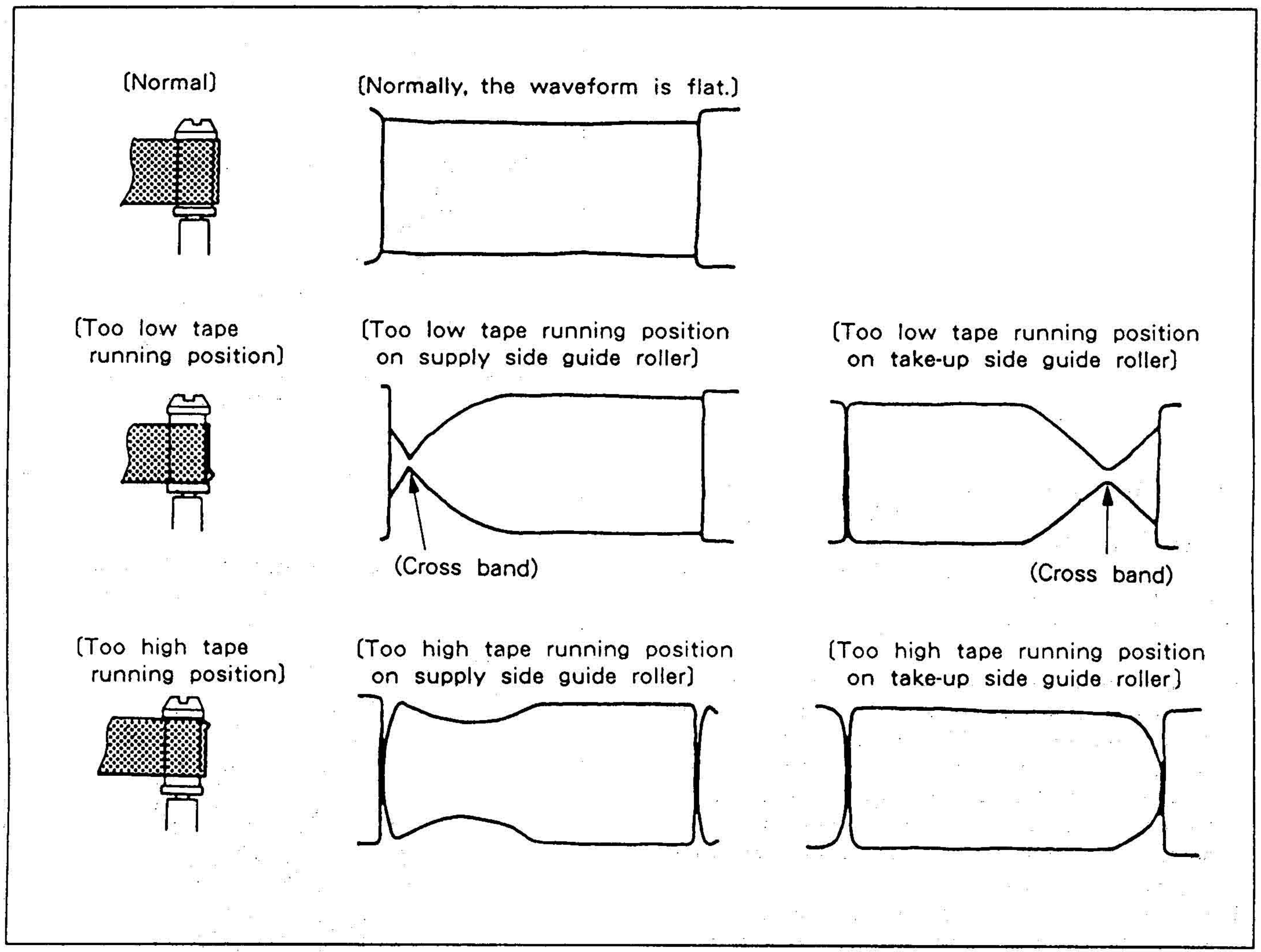
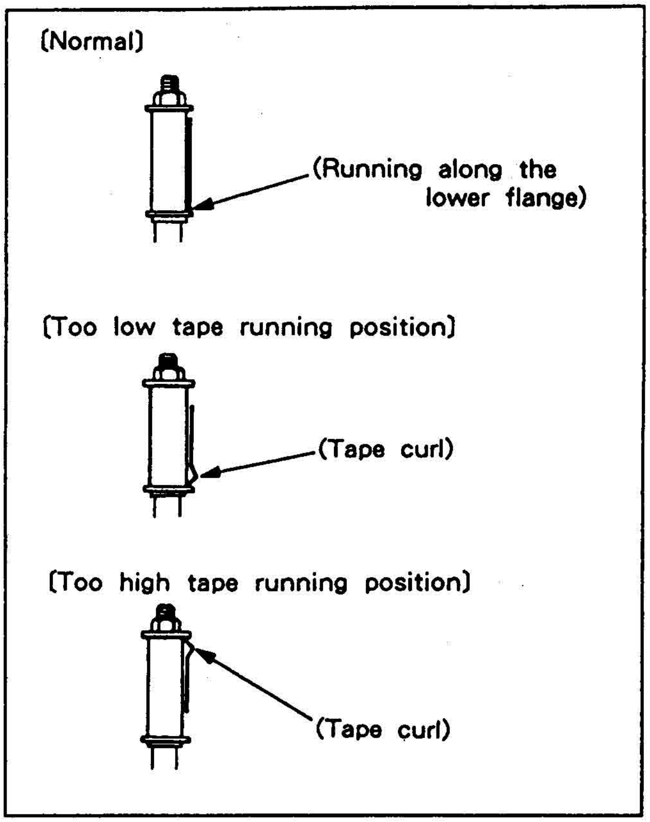

(Normal)
(Normally, the waveform is flat.)
(Too low tape running position)
(Too low tape running position on supply side guide roller)
(Cross band)
(Too low tape running position on take-up side guide roller)
(Cross band)
(Too high tape running position)
(Too high tape running position on supply side guide roller)
(Too high tape running position on take-up side guide roller)

Fig. 7-4-6. Guide Roller Adjustment

7-4-5.Tape Path Check of Exit Side Fixed Guide (T)(See Fig. 7-4-7.)

The fixed guide (T) of the exit side does not require adjustment in this mechanism.
Confirm that the lower edge portion of the tape is running close to the lower flange of the exit side fixed guide (T).
The tape should not be curled by the exit side fixed guide (T) upper and lower flanges.



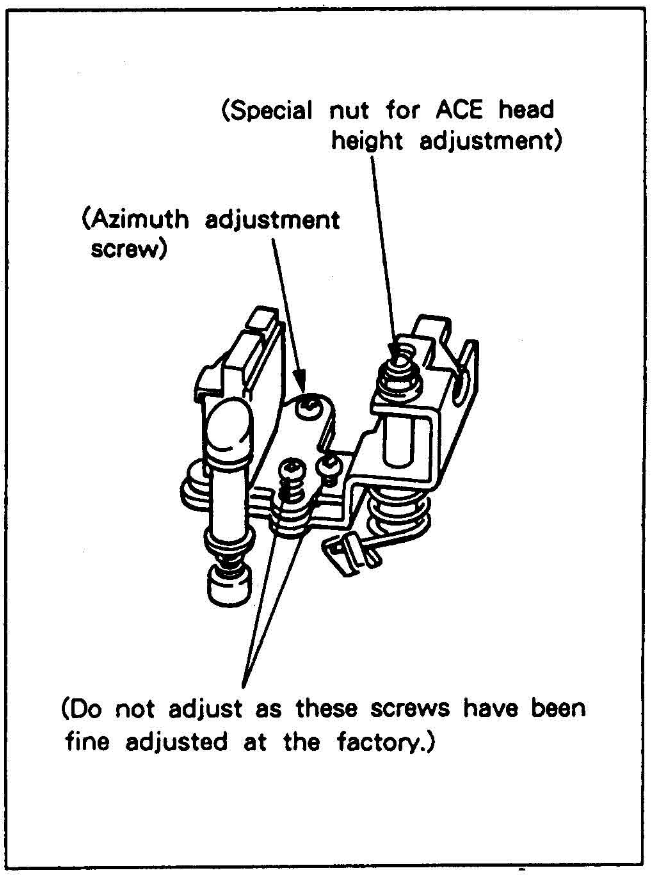
(Normal)
(Running along the lower flange)
(Too low tape running position)
(Tape curl)
(Too high tape running position)
(Tape curl)

Fig. 7-4-7. Fixed Guide(T)

7-4-6.COMPL Head Bracket (ACE Head) Adjustment

(1) Height Adjustment and Azimuth Adjustment (See Fig. 7-4-8.)

1) Load the alignment tape (NTSC HiFi 400Hz) and set the PLAY mode.
2) Monitor the audio output waveform with the oscilloscope.
3) Rotate the azimuth adjustment screw until the audio output waveform amplitude is maximum.
4) After loosening the ACE head height adjustment special nut, rotate it slowly clockwise until amplitude of the audio output waveform is maximum, then adjust it finely clockwise to the point just before the said waveform amplitude begins to decrease.
5) Rotate the azimuth adjustment screw until amplitude of the audio output waveform is maximum.
6) Confirm that the audio output waveform amplitude does not fluctuate.



(Special nut for ACE head height adjustment)
(Azimuth adjustment screw)
(Do not adjust as these screws have been fine adjusted at the factory.)

Fig. 7-4-8. Compl Head Bracket

(2) Tracking (X Value) Adjustment (See Fig. 7-4-9.)

1) Load the alignment tape (NTSC HiFi 400Hz) and set the PLAY mode.

2) Set tracking to the center position with the tracking control key (See Note below).

3) Rotate the stopper bracket fixing screw 180° counterclockwise.

4) Monitor the video head output envelope waveform with the oscilloscope.

5) Adjust the stopper bracket position so that amplitude of the envelope waveform becomes maximum at the tracking center and the envelope waveform amplitude changes by the same amount when shifting the tracking center by pressing the plus (+) and minus (−) tracking control keys.

6) Tighten the fixing screw.

7) (Model for LP mode tape speed capability)
Playback the alignment tape (VHJ-0052) and set the tracking to the center using a tracking control key.
Then confirm that the playback picture on screen is normal. If not, Make readjustment by referring to items 1) through 7). To readjust, playback MH-1 and finely adjust the position of the stopper bracket within the range in which the amplitude of the envelope waveform can be held to a maximum.

8) Perform servo circuit SW PHASE (Switching position) adjustment.

Note : For models equipped with auto tracking, always set to the manual tracking mode before adjustment. To confirm the tracking center position, press the tracking keys (+, −) and observe the front panel clock display. It will read "T − : −" at the tracking center, "T − : , T − − : " when keeping the minus (−) key pressed, and "T : −, T : − −" when keeping the plus (+) key pressed. The time indication will be restored 2 to 3 seconds after the tracking keys are released.

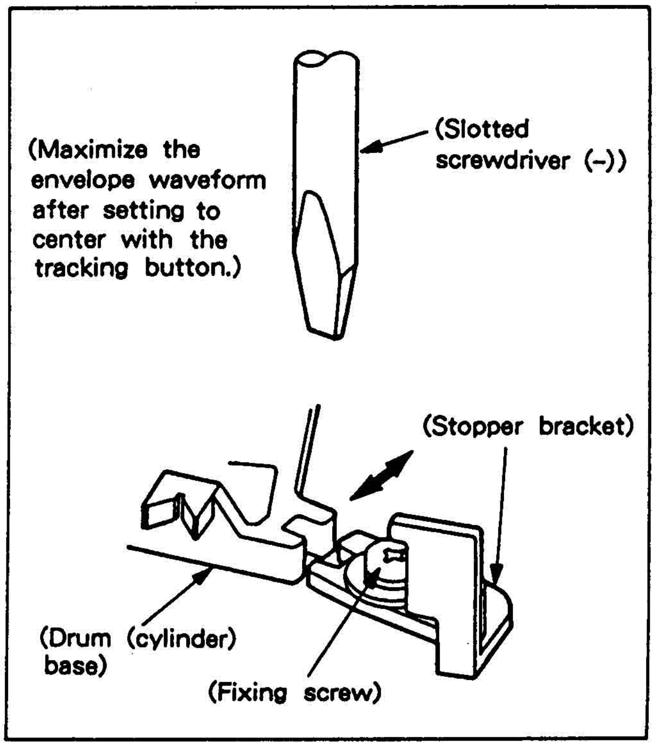

(Maximize the envelope waveform after setting to center with the tracking button.)
(Slotted screwdriver (-))
(Stopper bracket)
(Drum (cylinder) base)
(Fixing screw)

Fig. 7-4-9.

7-4-7.Checking After Adjustment

Tape running may show a slight change depending upon the type of the cassette tape (thick or thin tape), the start, middle, or end of cassette tape winding, etc. After performing the tape path adjustment with use of an alignment tape, be sure to check the following points. Incidentally, the alignment tape to be used should be T-120 or T-160 cassette should be a good one without any damage to it.

(1) Try to play back the alignment tape (NTSC HiFi 400Hz) and confirm that the envelope waveform rise immediately and that there is no flucuation in the envelope waveform and the audio output waveform.

(2) Load a cassette tape T-120 and start recording operation in the standard mode. 1 kHz should be fed to the audio input terminal when recording. After recording, the following points should be checked.

1. When the recorded portion is played back, the envelope waveform rise immediately, and no fluctuation in the envelope waveform is observed. Also, no speed drop occurs during the first half period or the last half period. Further, check to be sure that no fluctuation occurs in the audio waveform. Also confirm that neither the tape curling or derailing is caused on the upper or lower flange and the on the read side of the drum.
2. Confirm that no tape curling or derailing occurs in the upper or lower flange of each tape guide and the read side of the drum during each mode of operation, namely, FF, REW, F. SEARCH, and R. SEARCH.
3. Confirm that the envelope waveform rise immediately after changing the mode directly to the PLAY from each mode of FF, REW, F. SEARCH, R. SEARCH, or POWER OFF (INITIAL) and that no tape curling or derailing occurs in the upper or lower flange of the each tape guide and on the read side of the drum.

(3) Load a T-160 cassette tape and perform recording operation in the SP mode. 1 kHz should be fed to the audio input terminal when recording. Now, confirm that the envelope waveform rise immediately upon starting the playback of the recorded portion, and that neither fluctuation in the envelope waveform nor a speed drop occurs during the first half period or the last half period. Also confirm that no tape curling or derailing is caused in the upper or lower flange of each tape guide and on the drum lead surface.

(4) Perform recording for 60 seconds in the SP mode at the start of T-160 cassette winding. Play back the recorded portion and repeat the F.SEARCH ↔ R.SEARCH ten times, following which confirm that no damage is done to the tape edge. If any damage is found on the tape edge, a proper step must be taken as below depending upon the symptom obserbed.

1. When a sawtooth shaped damage is caused on underside of the tape edge by the REV guide
   1) Check to see if damage is done to the tape by the REV guide.
   2) Loosen the tilt adjustment screw of the ACE head bracket by turning it 135° counter-clockwise.
   3) Make readjustment of the ACE head bracket (azimuth, height and adjustment of X value) by seeing item P.11.
   4) Confirm that no fluctuation in the audio level is caused by loosening the tilt adjustment screw in steps 1) and 2) above. Move the screw a little back if any fluctuation is found (but never move it back to the original position). After adjusting the tilt adjustment screw is readjusted, perform step 4) once again.
   5) Confirm again that the T-160 cassette tape does not sustain any damage.
   6) Perform the recording and playback on the T-120 and T-160 cassette tape and confirm that no fluctuation occurs in the envelope waveform and the audio waveform.

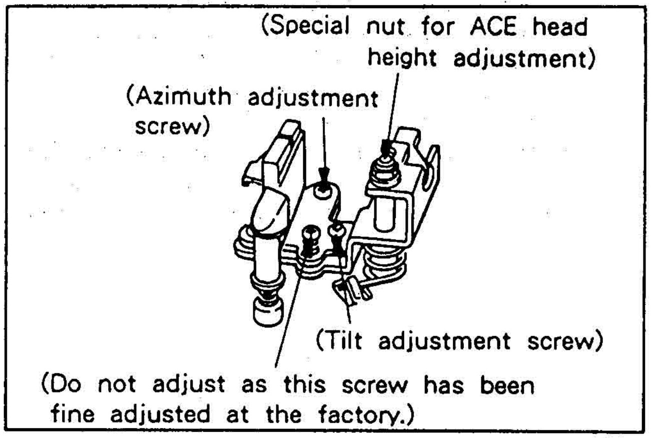

(Special nut for ACE head height adjustment)
(Azimuth adjustment screw)
(Tilt adjustment screw)
(Do not adjust as this screw has been fine adjusted at the factory.)

Fig. 7-4-10. Compl Head Bracket

2. If damage in the form of a sawtooth or a streak is found on the tape edge
   1) Check if a large amount of magnetic particles is adhered to the exit-side guide roller. If magnetic particles cannot be removed in spite of repeated cleaning, the guide roller must be replaced.
   2) Confirm if the tape is held too tightly by the exit-side guide roller, or if the last half of the envelope waveform is flat. If the type is found held too tightly, readjustment should be made by referring to 7-4.
   3) Recheck if the damage is still caused on the T-160 tape.
      If similar damage is still found on the tape, the exit-side guide roller should be loosened about 20° counterclockwise.
   4) Check once again that no fluctuation is caused in the envelope waveform or the audio waveform by loosening the exit-side guide roller. To do this, record and play back the T-160 cassette tape.

(5) Perform recording for 60 seconds in the SP mode at the near end of the T-160 cassette tape. Play back the recorded portion and repeat the F. SEARCH ↔ R. SEARCH ten times, following which a check should be made to see if damage is still done to the tape edge.
If a damage in the form of a sawtooth or a streak is still occurred on the tape edge by the upper lounge of entrance side guide roller, proceed with the step given below.

1. Check if a large amount of magnetic particles is adhered to the entrance-side guide roller. If the magnetic particles cannot be removed in spite of repeated cleaning, the guide roller must be replaced with new one.
2. Confirm if the tape is held too tightly by the entrance-side guide roller, or if the first half of the envelope waveform is flat. If the tape is found held too tightly, readjustment should be made by referring to 7-4.
3. Recheck if the damage is still caused on the T-160 tape.
   If the damage is still found on the tape, the entrance-side guide roller should be loosened about 20° counterclockwise.
4. Check once again that no fluctuation is caused in the envelope waveform or the audio waveform by loosening the entrance-side guide roller. To do this, record and play back the T-160 cassette tape.

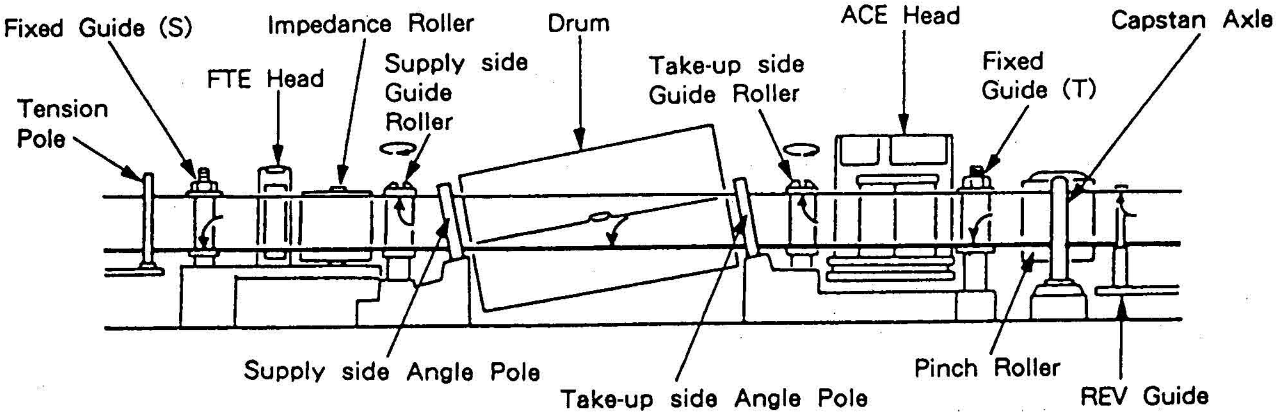
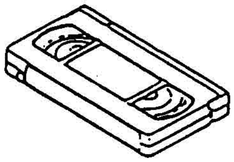


Fig. 7-4-11.

7-5. SERVICE JIGS

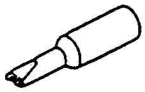
No.	Jig	Jig No.	Remarks
1	Alignment tape (MH-1)	H-7099-046-H	NTSC-NORMAL
	Alignment tape (NTSC HiFi 400Hz)	H-7099-153-H	NTSC MONOSCOPE
2	Eccentric screwdriver (VHJ-0003)	J-6082-044-A	For tape path adjustment
3	Nut box (VHJ-0048)	J-6082-045-A	For tape path adjustment
4	Torque gauge	H-7099-039-H	For reel tale-up torque measurement
5	Torque gauge adapter	H-7099-035-H	For reel take-up torque measurement
6	Fixed guide height gauge (VHJ-0053)	J-6082-052-A	For fixed gaude (S) height adjustment
7	Torque gauge screwdriver (VHJ-0014)	J-6082-047-A	For screw fastening torque adjustment
8	3mm dia. bit for torque screwdrirer (VHJ-0045)	J-6082-048-A	Spare bit for the torque gauge screwdriver
9	Video head removing tool (VHJ-0041)	J-6082-049-A	For upper drum removal
10	Mode selector (VHJ-0050)	J-6082-050-A	For mechanism mode selection
11	Master plane	H-7099-279-H	Reel table height
12	Reel disc height jig	H-7099-038-H	Reel table height
13	Mode selector relay board (VHJ-0075)	J-6090-008-A	Relay board for mode selector
14	Torque cassette (VHT-063S) (NTSC)	J-6082-011-A	For back tension torque, For REW torque
15	26-pin flexible flat cable (VHJ-0064)	J-6090-006-A	Spare cable for mode selector
16	7-wire flat cable (VHJ-0076)	J-6090-009-A	Spare cable for relay board
17	REV guide lever removing tool (VHJ-0073)	J-6090-007-A	For REV guide lever removal

H-7099-046-H



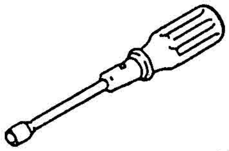
H-7099-153-H **No. 1**

J-6082-044-A (VHJ-0003)



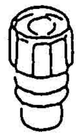
No. 2

J-6082-045-A (VHJ-0048)



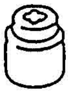
No. 3

H-7099-039-H



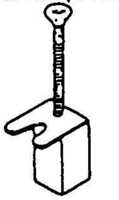
No. 4

H-7099-035-H



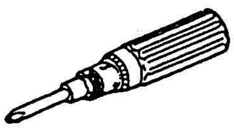
No. 5

J-6082-052-A (VHJ-0053)



No. 6

J-6082-047-A (VHJ-0014)



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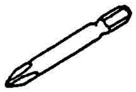
J-6082-048-A (VHJ-0045)



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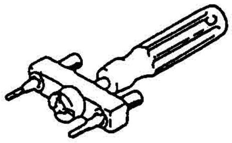
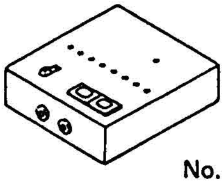
J-6082-049-A (VHJ-0041)



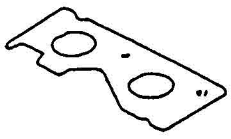
No. 9

J-6082-050-A (VHJ-0050)



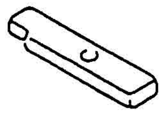
No. 10

H-7099-279-H



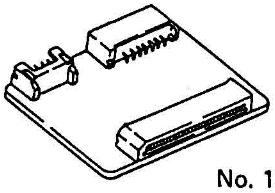
No. 11

H-7099-038-H



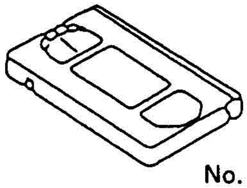
No. 12

J-6090-008-A (VHJ-0075)



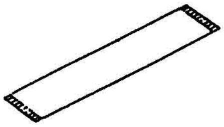
No. 13

J-6082-011-A



No. 14

J-6090-006-A (VHJ-0064)



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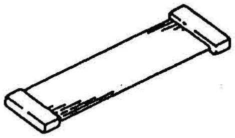
J-6090-009-A (VHJ-0076)



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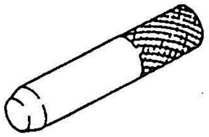
J-6090-007-A (VHJ-0073)



No. 17

7-6. MECHANISN MAINTENANCE AND CHECKING

7-6-1.Periodic Checking and Maintenance Items and Service Jigs

The following maintenance and periodic checking procedures are recommended to ensure proper operation, and to protect the tape from dirt and damage. Also these procedures should always be followed after repairing the unit.

(1) PERIODIC CHECK ITEMS

○ Cleaning ◎ Confirmation △ Lubrication □ Exchange

Part	Usage Time (hours)	500H	1000H	1500H	2000H	2500H	3000H	3500H	4000H	4500H	5000H
Tape Path System	ASSY, HOLDER, BAND		◎		□		◎		□		◎
	COMPLE, CYLIDER, 2N4P	○	○	○	○	○	○	○	○	○	○
	ASSY, CYLINDER, UPR, 2N4P	○	◎ (□)	◎ (□)	◎ (□)	◎ (□)	◎ (□)	◎ (□)	◎ (□)	◎ (□)	◎ (□)
	SPECIAL WASHER	○	○	○	○	○	○	○	○	○	○
	TAPE GUIDE	○	○	○	○	○	○	○	○	○	○
	COMPL, BRACKET, HEAD	○	○	○	○	○	□	○	○	○	○
	ASSY, LEVER, REV GUIDE	○	○	○	○	○	○	○	○	○	○
	COMPLE, PINCH POLLER	○	○	○	□	○	○	○	□	○	○
	ASSY, GUIDE, ROLLER	○	○	○	○	○	○	○	○	○	○
	HEAD, FULL ERASE	○	○	○	○	○	□	○	○	○	○
	ROLLER, IMPEDANCE				○ △				○ △		
	ASSY, EARTH, CYL.						□				
Reel Drive System	ASSY, REEL, SUPPLY		○		○ △		○		○ △		○
	ASSY, REEL, TAKE UP		○		○ △		○		○ △		○
	ASSY, GEAR, ONEWAY		○		○ △		○		○ △		○
	GEAR, REEL TAKE UP		○		○ △		○		○ △		○
	COMPLE, IDLER,CLUTCH				△				△		
	ASSY, IDLER		◎		◎		□		◎		◎
	PULLY, REEL				△				△		
	MOTOR, CAPSTAN	○	○	○	○	○	○	○	○	○	□
	BELT, REEL DRIVE				□				□		
	ASSY, GEAR, FRICTION		◎		△ □		◎		△ □		◎
Brake	ASSY, BRAKE SUB T		◎		◎		◎□		◎		◎
	ASSY, BRAKE, SUPPLY		◎		□		◎		□		◎
	ASSY, BRAKE, TAKE UP		◎		□		◎		□		◎
	ASSY, BRAKE, CAPSTAN		◎		□		◎		□		◎
Loading Drive System	HOLDER, WORM				△				△		
	ASSY, LOADING MOTOR						□				
	BELT, LOADING				□				□		
	GEAR, HELICAL				△				△		
	CAM, MODE				△				△		
	CAM, MAIN				△				△		
Performance Check	FF, REW, REV, PLAY TORQUE		◎		◎		◎		◎		◎
	PLAY B • T TORQUE		◎		◎		◎		◎		◎

Note : The back tension torque is the value that has been measured by the cassette torque meter (VHT-063S). The torque of FF, REV, REW, and PLAY represent those measured with them locked by the torque guage. FF and REW are values 2 seconds after starting.

Torque value :
FWD : 600 gcm or more
REW : 600 gcm or more
PLAY (2H): 100 to 160 gcm
REV : 210 to 280 gcm
Back tension : 52 ± 13 gcm

(2) CLEANING

1. Drum (COMPL CYLINDER) and Video Heads
   (See Fig. 7-6-1.)

1) Wrap a chamois leather around your finger and moisten it with methyl alcohol.
2) Move the chamois leather to left and right several times on the video head to clean. There is a video head also on the opposite side, so clean it likewise. In this models, clean the audio head also.
3) Clean the tape path surface of the cylinder in the same way.

Note: Always turn power off before cleaning. Never move the chamois leather vertically or apply too much force to the head ; it may be damaged.

2. Cleaning of the Tape Guide System
   (See Fig. 7-6-2.)

Set the EJECT mode and clean the tape guide system (tape guides, impedance roller, FTE head, ACE head, pinch rollers, capstan axles, etc.) with a chamois leather moistened with methyl alcohol.

Note: Make sure that no oil, grease, etc. adhere to the chamois leather and that heads are not damaged.

3. Cleaning of the Drive System

Clean the drive system (loading belt, reel drive belt, pulley, supply reel table, etc.) with a soft cloth moistened with methyl alcohol.

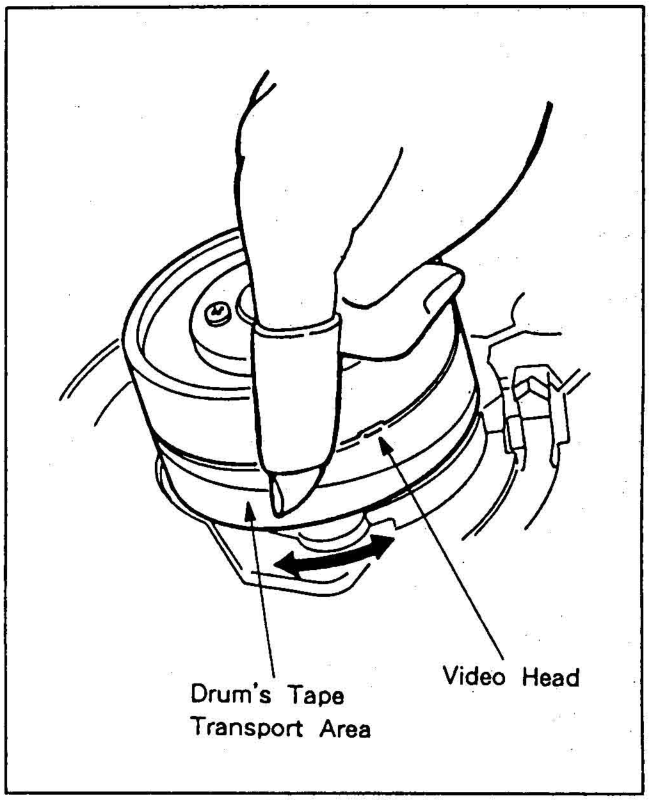

Video Head
Drum's Tape
Transport Area

Fig. 7-6-1.

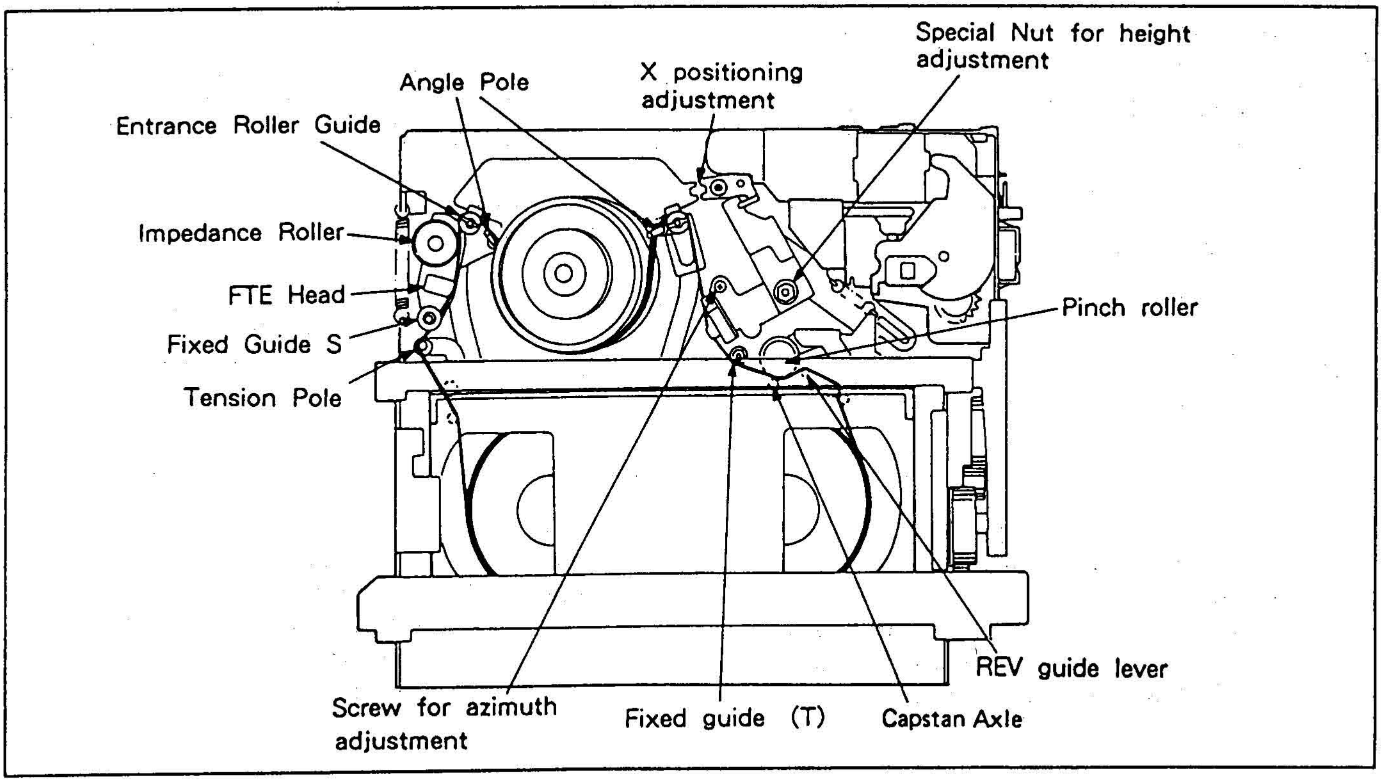

Special Nut for height adjustment
Angle Pole
X positioning adjustment
Entrance Roller Guide
Impedance Roller
FTE Head
Fixed Guide S
Tension Pole
Pinch roller
REV guide lever
Screw for azimuth adjustment
Fixed guide (T)
Capstan Axle

Fig. 7-6-2. Cleaning

7-6-2. Mode Selector (VHJ-0050) Handling Instructions

The mode selector drives the loading motor of the P91 mechanism with its internal batteries (UM-2 × 4 = 6V), using LEDS to indicate the mode (EJECT, INITIAL, BRAKE, STOP/REW/FWD, STILL, PLAY, IDLER, REV) simultaneously with EJECT⇔REV mode changes.
Instead of the internal batteries, an external DC 6V power supply can also be used.

(1) PART NAMES (See Fig. 7-6-3.)

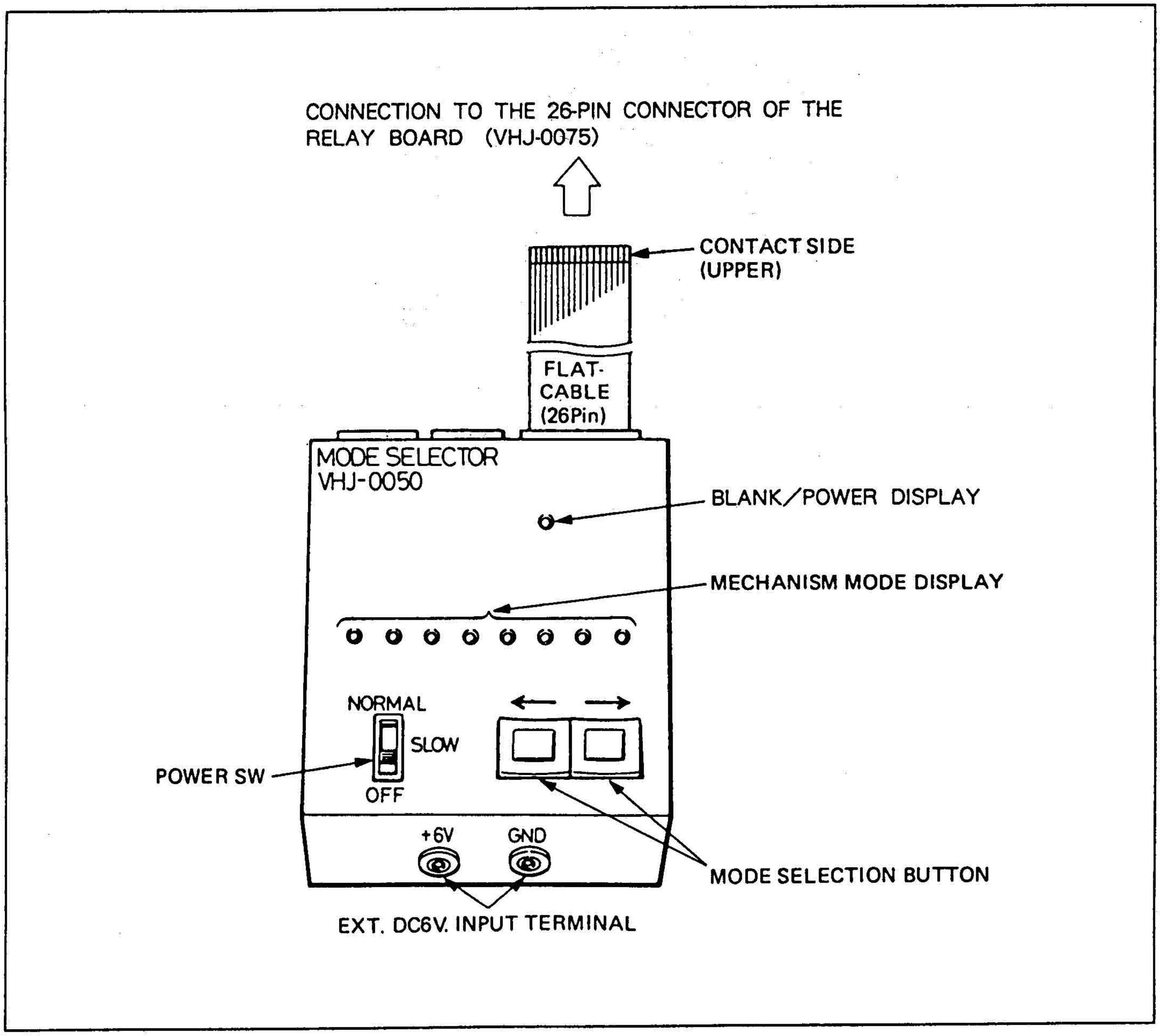

CONNECTION TO THE 26-PIN CONNECTOR OF THE RELAY BOARD (VHJ-0075)
CONTACT SIDE (UPPER)
FLAT-CABLE (26Pin)
MODE SELECTOR VHJ-0050
BLANK/POWER DISPLAY
MECHANISM MODE DISPLAY
NORMAL
SLOW
OFF
POWER SW
+6V
GND
MODE SELECTION BUTTON
EXT. DC6V. INPUT TERMINAL

Fig. 7-6-3.

(2) CONNECTION METHOD

1. Connection for model VH-90
(See Fig. 7-6-4.)

1) Remove the 7-wire cable connected from the system control circuit to the connector (CN822) of the MC-3 board.
2) Connect the 7-wire cable (VHJ-0076) between the connector (CN822) of the MC-3 board and the 7-pin connector of the Mode Selector Connection Board (VHJ-0075).
3) Remove the 6-wire cable extending from the cassette holder section from the connector of the System Control Circuit Board and connect it to the 6-pin connector of the Mode Selector Connection Board (VHJ-0075).
4) Connect a supplied 26-pin flat cable (VHJ-0064) of the mode selector (VHJ-0050) between the mode selector body and the 26-pin connector of the Connection Board (VHJ-0075).

Note: Care should be taken to avoid mistaking the direction of the contacting side when connecting a flexible flat cable.

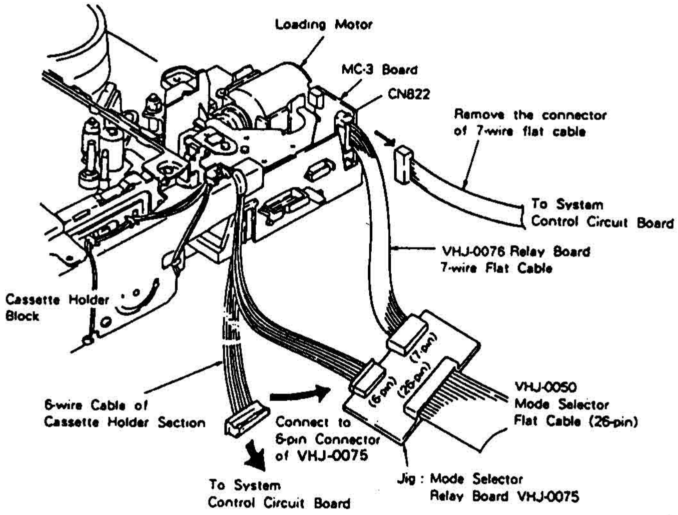

Loading Motor
MC-3 Board
CN822
Remove the connector of 7-wire flat cable
To System Control Circuit Board
VHJ-0076 Relay Board 7-wire Flat Cable
Cassette Holder Block
(7-pin)
(26-pin)
(6-pin)
VHJ-0050 Mode Selector Flat Cable (26-pin)
6-wire Cable of Cassette Holder Section
Connect to 6-pin Connector of VHJ-0075
To System Control Circuit Board
Jig : Mode Selector Relay Board VHJ-0075

Fig. 7-6-4. Connection

(3) HANDLING METHOD

1) The mode changes in sequence of EJECT, INITIAL, BRAKE, STOP/REW/FF, STILL, PLAY, IDLER, REV when the right side (⇨) of the mode selector button is kept on pressing.
2) To change the mode from REV to EJECT, press the left side (⇨) of the mode selector button to select the desired mode.
3) In the mid position of each mode during a shift to other mode, the "BLANK" LED lights. But the "PLAY", "IDLER", "REV" LEDs light between the EJECT mode and the INITIAL mode. Be sure therefore to check the mechanism body to see just what state the mechanism is in.
   Incidentally, if the mode selector is not connected to the mechanism, the "BLANK" LED lights to indicate the power ON.
4) The SLOW position of POWER switch makes relatively slow motions in comparison with the NORMAL position.

Note 1: The mode selector drives the loading motor only, not affecting the head drum motor and the capstan motor. When using the mode selector with a cassette loaded, turn the capstan motor manually to remove tape slackness, preventing tape entanglement.

Note 2: If the Left side (⇦) of the mode selector (VHJ-0050) key is kept pressed with the COMPL cassette mechanism removed, it might get past the EJECT position, causing the front helical gear and the front worm gear to get disengaged.

In this condition, since the front helical gear will not turn even if the right side (⇨) of the mode selector key is pressed, rotate (push) the front helical gear clockwise by hand and engage it with the front worm gear. As there is a misalignment between the mechanism main body operation mode (indicated by the mode selector indicator lamps) and the front loading mechanism operation mode, keep the right side (⇨) of the mode selector key pressed until the front helical gear and the front loading gear of the front loading mechanism get back to the initial condition. (See A and B in Fig. 7-7-9. of page 109. Loading Motor.)

When the front loading mechanism returns to the initial condition, operation mode of the whole mechanism gets back to normal, matching the mode shown by the mode indicator lamps (mode EJECT would not be properly indicated during eject).

Sometimes, engagement of the front helical gear with the front worm gear is delayed and operation mode. The mechanism main body gets too much ahead and the front loading mechanism mode cannot be switched to the initial condition. In that case, press the Left side (⇦) of the mode selector key, setting the mechanism main body operation mode back to EJECT (rotation of the mode cam and the MAIN CAM stops).

Note 3: The mode indicator lamps show the mechanism operation mode, but the EJECT lamp may sometimes fail to indicate the actual mechanism operation mode.

When setting the mechanism to the EJECT or INITIAL mode for dismounting or reassembling, fine adjustment of the each gear and cam, etc., marking positions is required after the mode indicator lamp has lighted up. Perform this with the mode selector switch in the SLOW position.

7-7. MECHANISM DISMANTLING AND REASSEMBLING

7-7-1. Mechanism Main Unit (See Fig. 7-7-1.)

1. Removal
1) Remove the connectors of the COMPL MC-3 and the COMPL HEAD BRACKET.
2) Remove the flexible cable ① connecting the COMPL CYLINDER to the PRE-AMP UNIT ③. (See Fig. A.)
3) Remove the two screws ②, then remove the PRE-AMP UNIT ③.
4) Remove the two screws ④, then remove the PRE-AMP BRACKET ⑤.
5) Remove the two screws ⑥.
6) Remove the three screws ⑦ and two screws ⑩, then lift up the mechanism main unit and remove it.
Since the TRAY ⑧ obstructs removal of the two front screws ⑩, move the TRAY LOCK LEVER ⑨ in the direction of the arrow to unlock, then slide the TRAY ⑧ before removing the screws. (See Fig. B)

Note: Shape of the PRE-AMP UNIT ③ and the PRE-AMP BRACKET ⑤ differ depending on the model.

2. Remounting
1) Mount the mechanism main unit onto the chassis with the three screws ⑦ and two screws ⑩.
2) Tighten the two screws ⑥.
3) Mount the PRE-AMP BRACKET ⑤ with the two screws ④.
4) Mount the PRE-AMP UNIT ③ and the ground lug with the two screws ②. (some models are not provided with a ground lug.)
5) Insert the flexible cable ① into the connector of the PRE-AMP UNIT.
6) Connect the connectors of the COMPL MC-3 and COMPL HEAD BRACKET.

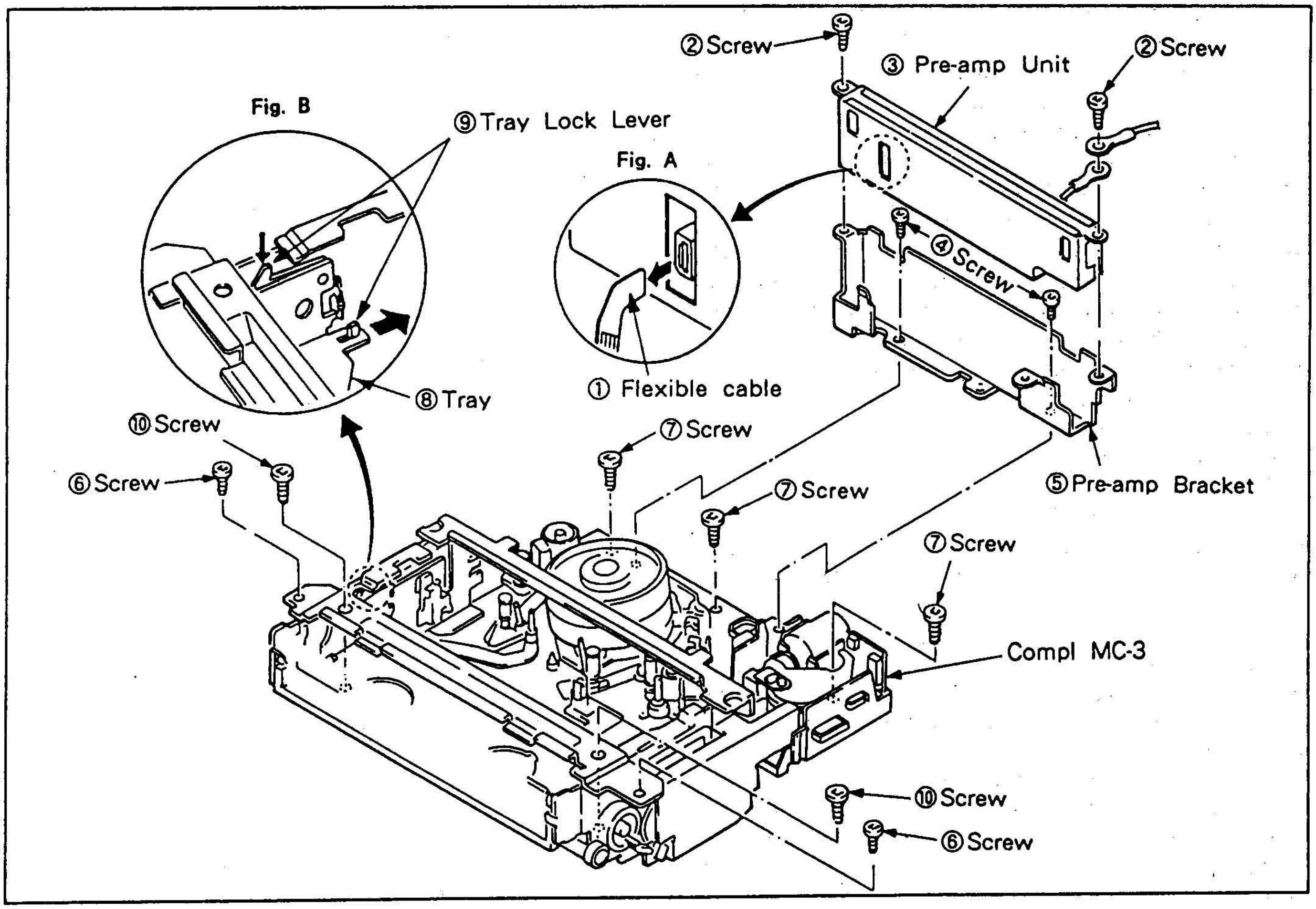

②Screw
③ Pre-amp Unit
②Screw
Fig. B
⑨Tray Lock Lever
Fig. A
④Screw
① Flexible cable
⑧Tray
⑩Screw
⑦Screw
⑥Screw
⑦Screw
⑤Pre-amp Bracket
⑦Screw
Compl MC-3
⑩Screw
⑥Screw

Fig. 7-7-1. Mechanism Main Unit

7-7-2.Cassette Mechanism Assembly

(1) COMPL CASSETTE MECHANISM
(See Fig. 7-7-2.)

1. Removal

1) Set the video main unit to the EJECT completed mode.

2) Pull out the connectors (6-PIN CONNECTOR connected to the system control circuit board, ACE HEAD CONNECTOR, and FTE HEAD CONNECTOR) from CASSETTE HOLDER.

3) Remove the two screws ①.

4) Remove the two screws ②.

5) Lift up the COMPL CASSETTE MECHANISM ④ back a little and remove the two hooks ③ on the front. (See Fig. B.) When doing so, make sure that the SAFETY SWITCH LEVER is not caught by the mechanism chassis.

2. Remounting

1) Set the chassis section mechanism to the EJECT mode with the mode selector (VHJ-0050) (looking from the top, align the EJECT mode positioning alignment hole ⑤ to the MOTOR HOLDER hole ⑥ as shown in Fig. A).

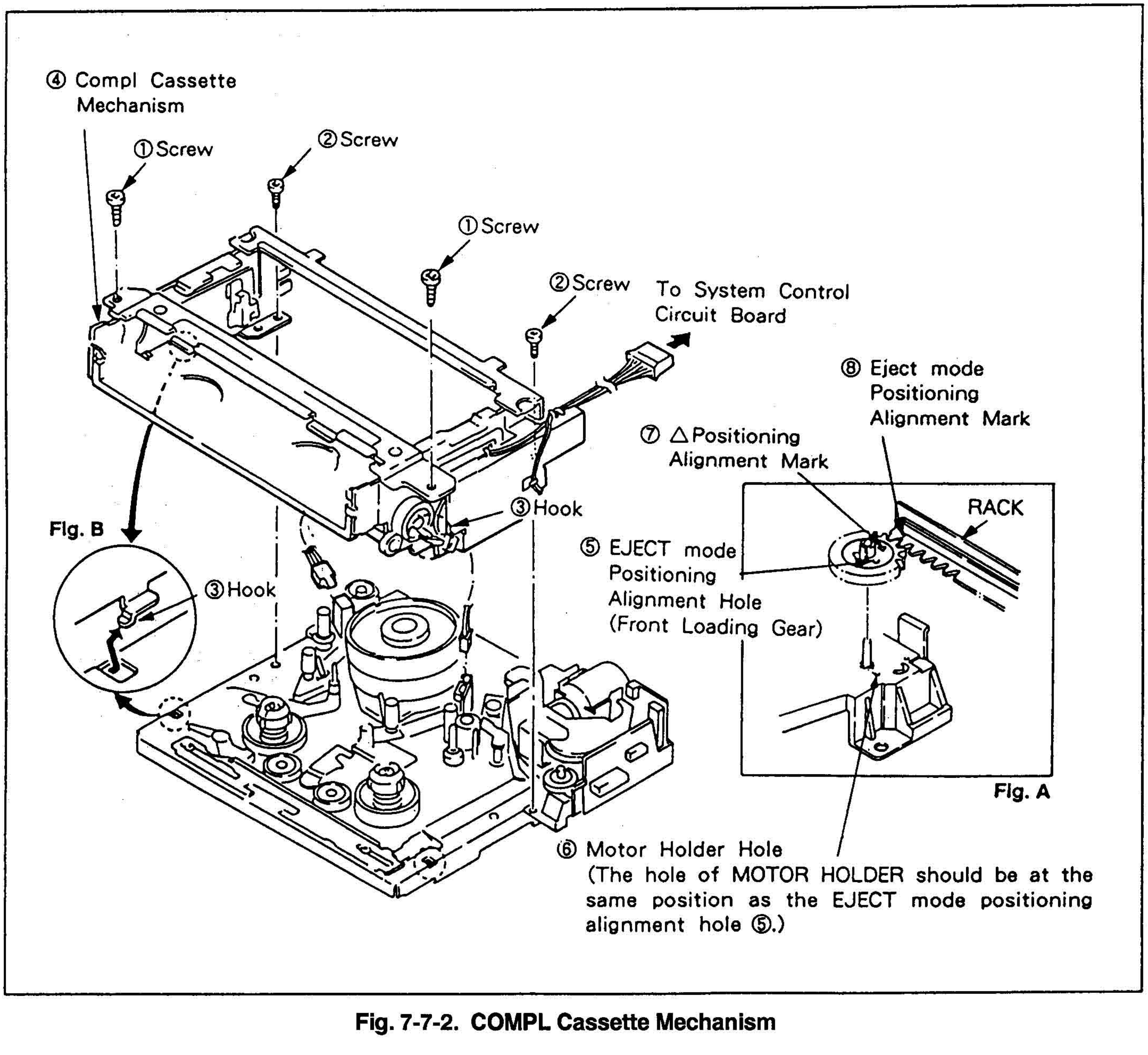
2) Set the COMPL CASSETTE MECHANISM ④ to the EJECT completed mode.

3) Mount the COMPL CASSETTE MECHANISM ④ onto the mechanism chassis, aligning it with the protuberance.
Align the EJECT mode positioning alignment mark ⑧ to the △ positioning alignment mark ⑦. (See Fig. A)

4) Fix to the mechanism chassis with the two screws ②.

5) Fix to the chassis with the two screws ①.

6) Connect to the various connectors.


④ Compl Cassette Mechanism
①Screw
②Screw
①Screw
②Screw
To System Control Circuit Board
⑧ Eject mode Positioning Alignment Mark
⑦ △Positioning Alignment Mark
RACK
③Hook
Fig. B
③Hook
⑤ EJECT mode Positioning Alignment Hole (Front Loading Gear)
Fig. A
⑥ Motor Holder Hole

(The hole of MOTOR HOLDER should be at the same position as the EJECT mode positioning alignment hole ⑤.)

Fig. 7-7-2. COMPL Cassette Mechanism

(2) GEAR BRACKET ASS'Y (See Fig. 7-7-3.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in 7-7-2.
2) Remove the four screws ①, then remove the GEAR BRACKET ASS'Y ② as shown in Fig. A.
3) Remove the E ring ③, then remove the LOCK GEAR ④, the PINION LEVER ASS'Y ⑤, the PINION GEAR ⑥ and the RACK ⑦, in that order.

2. Remounting

1) Apply grease to the shaft ⑧ and the two pins ⑨ of the GEAR BRACKET ASS'Y.
2) Apply grease to the pin ⑩ of the PINION LEVER ASS'Y.
3) Apply grease to the toothed part of the RACK ⑦.
4) Fit the RACK ⑦ onto the two pins ⑨. Align the positioning alignment hole ⑪ to the positioning alignment hole ⑫ of the GEAR BRACKET.
5) Mount the PINION GEAR ⑥, PINION LEVER ASS'Y ⑤, and LOCK GEAR ④ in the shaft ⑧ in the order mentioned.
Align the positioning alignment holes ⑬ of PINION GEAR and LOCK GEAR with the positioning alignment hole ⑪ of RACK at that time.
6) Mount the E ring ③ onto the shaft ⑧.
7) Set the GEAR BRACKET ASS'Y ② to the dowel and mount it using four screws ①.
Align the positioning alignment hole Ⓐ of the IDLER GEAR with the positioning alignment hole Ⓑ of the SIDE BOARD as shown in Fig. 5-7-4. at this time.
Also align the positioning alignment holes ⑬ of PINION GEAR and LOCK GEAR with the positioning alignment hole ⑫ of GEAR BRACKET by referring to Fig. 7-7-3. After mounting them, check to be sure that FL START SWITCH ⑭ is in the ON state shown in Fig. A.
8) Remount the COMPL CASSETTE MECHANISM as instructed in P.101.

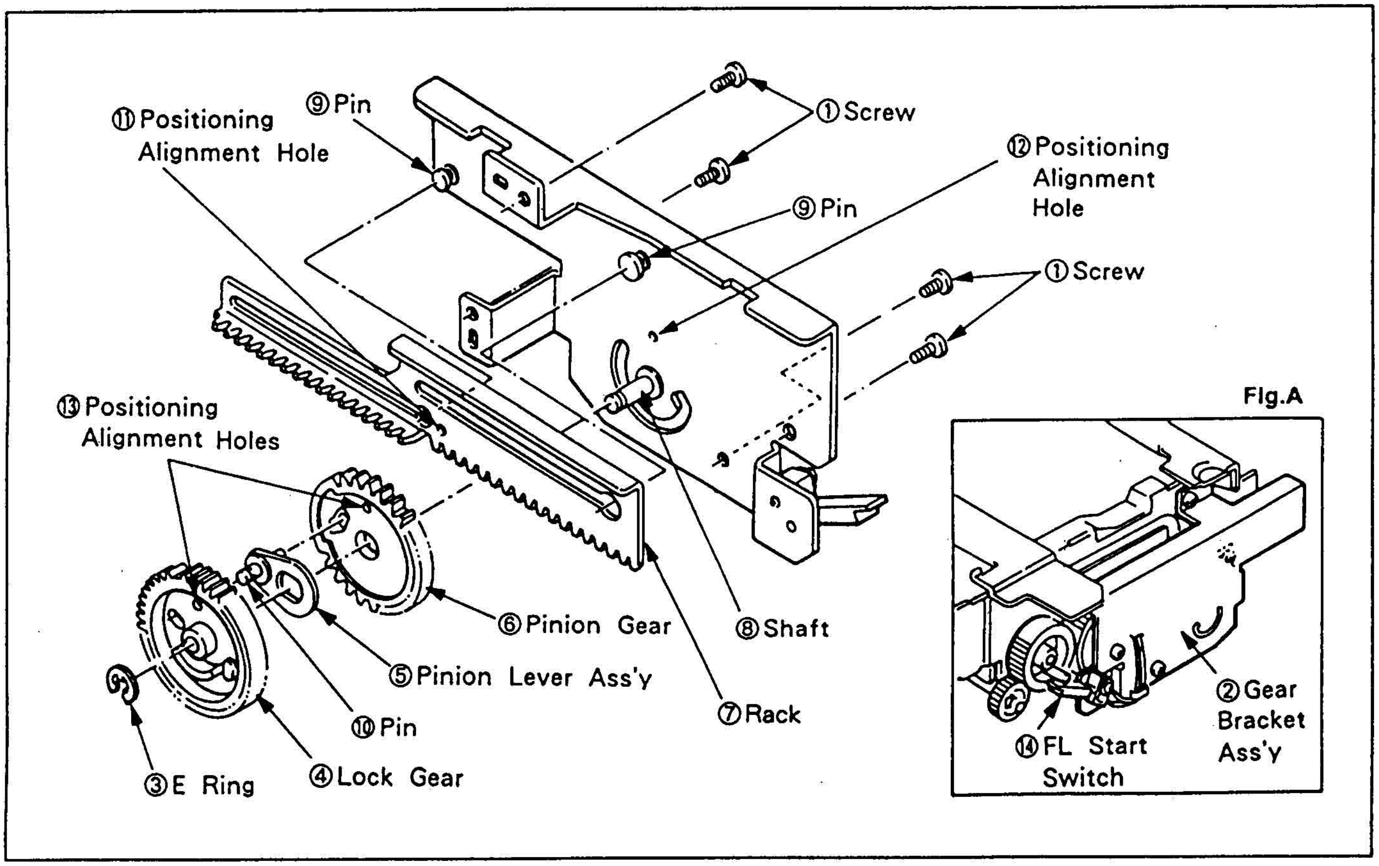

⑪ Positioning Alignment Hole
⑨ Pin
① Screw
⑫ Positioning Alignment Hole
⑨ Pin
① Screw
⑬ Positioning Alignment Holes
⑥ Pinion Gear
⑤ Pinion Lever Ass'y
⑩ Pin
③ E Ring
④ Lock Gear
⑧ Shaft
⑦ Rack
Fig.A
② Gear Bracket Ass'y
⑭ FL Start Switch

Fig. 7-7-3. Gear Bracket Ass'y

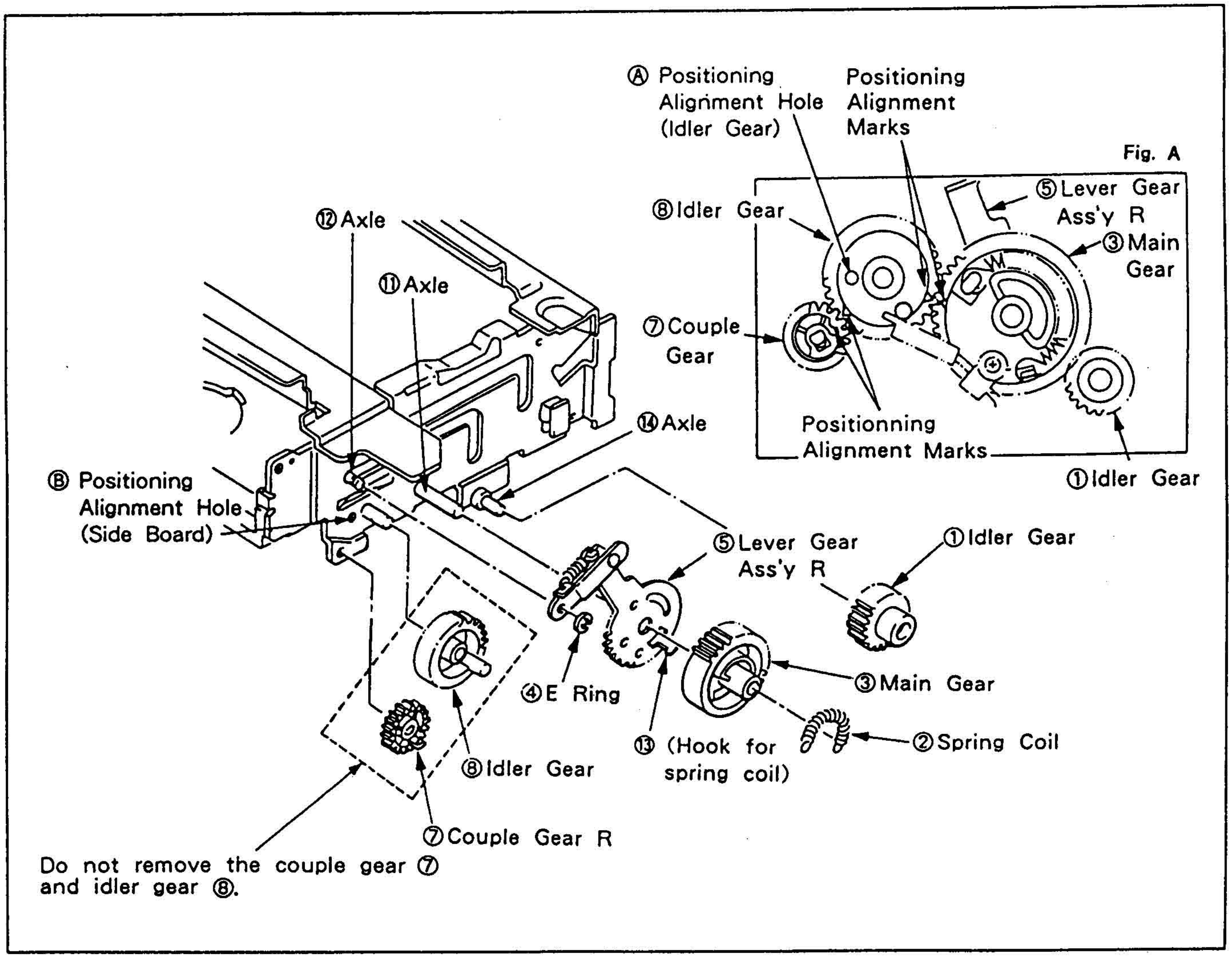
(3) CASSETTE DRIVE GEAR (RIGHT)
(See Fig. 7-7-4.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM and the GEAR BRACKET ASS'Y as instructed in P.102. and P.103., respectively.
2) Remove the IDLER GEAR ①.
3) Remove the SPRING COIL ②, then remove the MAIN GEAR ③.
4) Remove the E ring ④, then remove the LEVER GEAR ASS'Y R ⑤.

2. Remounting

1) Apply grease to gear parts that undergo friction.
2) Align the positioning alignment hole Ⓐ of IDLER GEAR ⑧ with the positioning alignment hole Ⓑ of SIDE BOARD.
3) Mount the LEVER GEAR ASS'Y R ⑤ onto the axles ⑪ and ⑫. Align with the IDLER GEAR ⑧ as shown in Fig. A.
4) Mount the E ring ④ onto the axle ⑫.
5) Mount the MAIN GEAR ③ onto the axle ⑪. When doing so, align with the IDLER GEAR ⑧ as shown in Fig. A.
6) Hook the SPRING COIL ② to the notch ⑬ in the MAIN GEAR ③ and the LEVER GEAR ASS'Y R.
7) Mount the IDLER GEAR ① onto the axle ⑭. When doing so, align with the MAIN GEAR as shown in Fig. A.
8) Mount the GEAR BRACKET ASS'Y and the COMPL CASSETTE MECHANISM as instructed in P.103. and P.102., respectively.


Ⓐ Positioning Alignment Hole (Idler Gear)
Positioning Alignment Marks
Fig. A
⑧Idler Gear
⑤Lever Gear Ass'y R
③Main Gear
⑦Couple Gear
Positionning Alignment Marks
①Idler Gear
⑫Axle
⑪Axle
⑭Axle
Ⓑ Positioning Alignment Hole (Side Board)
⑤Lever Gear Ass'y R
①Idler Gear
④E Ring
③Main Gear
⑬ (Hook for spring coil)
②Spring Coil
⑧Idler Gear
⑦Couple Gear R

Do not remove the couple gear ⑦ and idler gear ⑧.

Fig. 7-7-4. Cassette Drive Gears(Right Side)

(4) CASSETTE DRIVE GEAR (LEFT)
(See Fig. 7-7-5.)

1. Removal
1) Remove the COMPL CASSETTE MECHANISM as instructed in P.101.
2) Remove the E ring ②.
3) Open the hook ③, then remove the LEVER GEAR ASS'Y L ④. Take care not to open the hook ③ too much, otherwise it may get deformed or broken. If it does, replace it.
4) Remove the SPRING COIL ⑤ from the LEVER GEAR ASS'Y L ④.

2. Remounting
1) Apply grease to the axle ⑨ and shaft ⑩.
2) Align with the COUPLE GEAR L ⑬ and the IDLER GEAR L ⑥ as shown in Fig B.
3) Hook the SPRING COIL ⑤ to the LEVER GEAR ASS'Y L ④.
4) Mount the LEVER GEAR ASS'Y L ④ onto the axle ⑨ and the shaft ⑩. Align with the IDLER GEAR L ⑥ as shown in Fig. B.
5) Mount the COMPL CASSETTE MECHANISM onto the chassis as instructed in P.101.

Note: The end of the DOOR OPEN LEVER ⑦ leans against the front side of the CASSETTE DOOR ⑪ as shown in Fig. A.

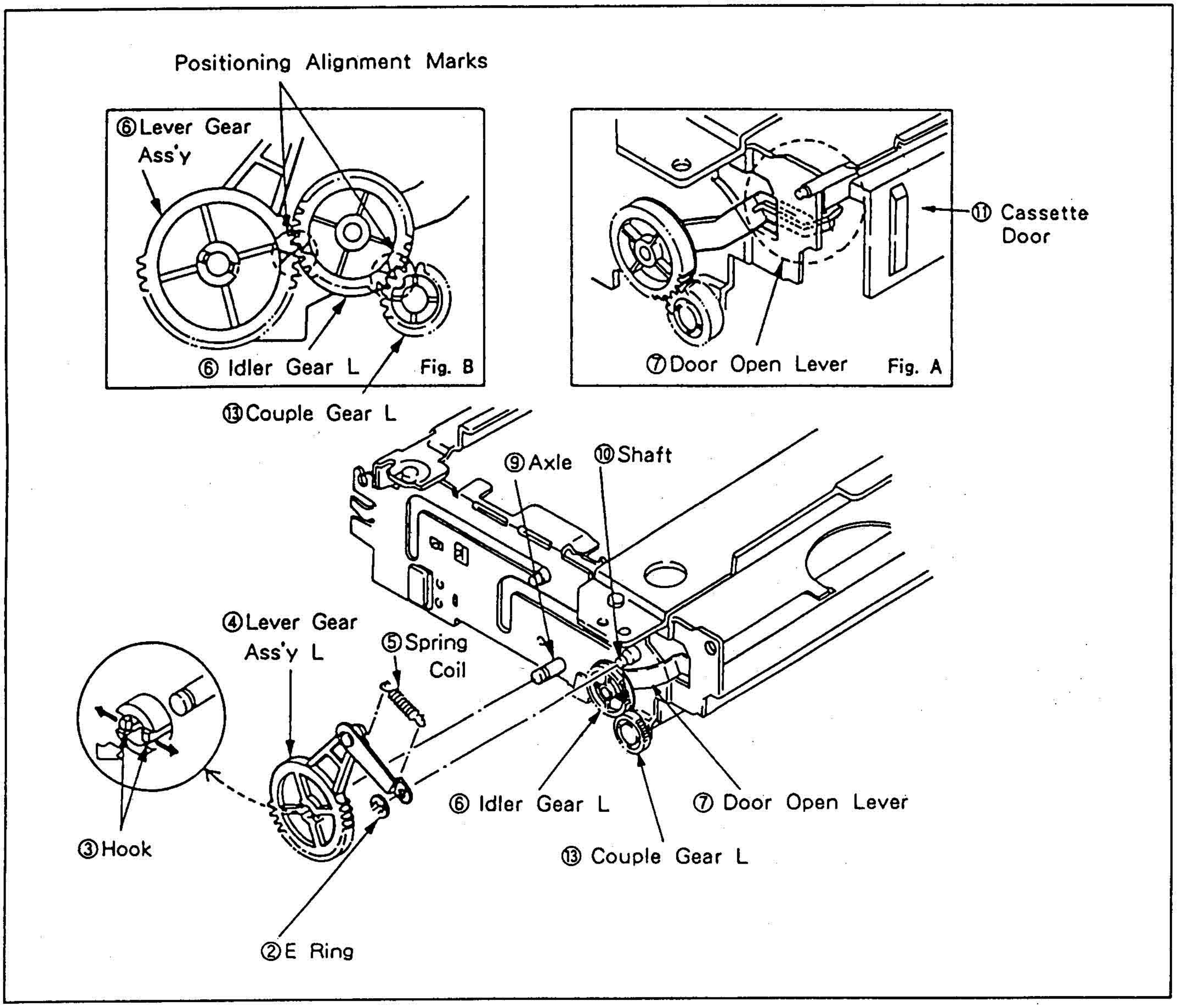

Positioning Alignment Marks
⑥Lever Gear Ass'y
⑥ Idler Gear L
Fig. B
⑬Couple Gear L
⑪ Cassette Door
⑦Door Open Lever
Fig. A
⑨Axle
⑩Shaft
④Lever Gear Ass'y L
⑤Spring Coil
③Hook
⑥ Idler Gear L
⑦ Door Open Lever
⑬ Couple Gear L
②E Ring

Fig. 7-7-5. Cassette Drive Gears(Left Side)

(5) FL START SWITCH (See Fig. 7-7-6.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in P.101.

2) Remove the screw ①.

3) Remove the lead wire of the FL START SWITCH ②.

2. Remounting

1) Solder the lead wire to the FL START SWITCH ② terminal.

2) Align the FL START SWITCH ② protuberance to the hole ⑤, then mount it onto the GEAR BRACKET ASS'Y ③ with the screw ①. Do it so that the FL START SWITCH ② is turned ON by holding the pin ④ of IDLER GEAR in the EJECT completed mode.

3) Mount the COMPL CASSETTE MECHANISM as instructed in P.101.

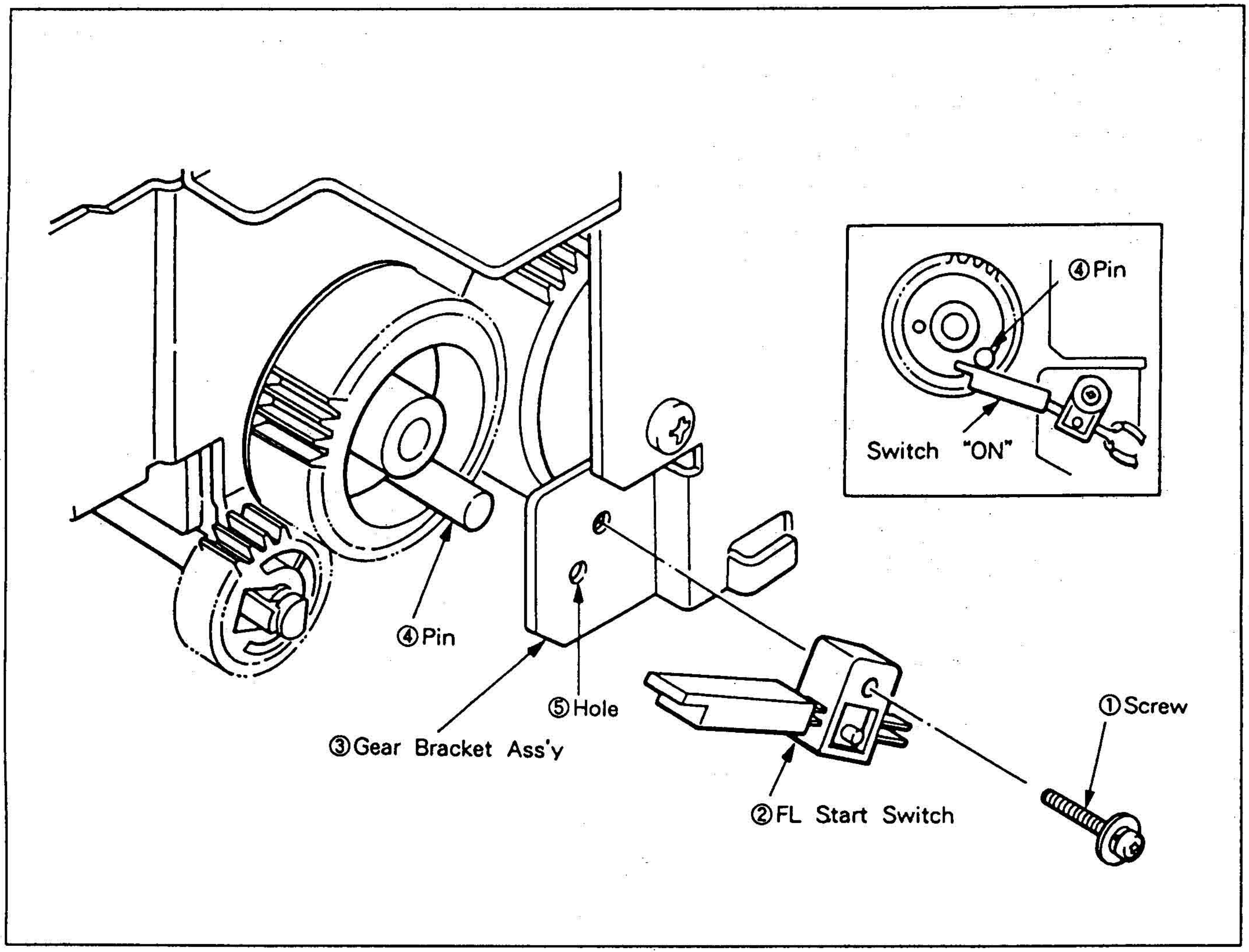

④Pin
Switch "ON"
④Pin
⑤Hole
③Gear Bracket Ass'y
①Screw
②FL Start Switch

Fig. 7-7-6. FL Start Switch

(6) T-TOP SENSOR, T-END SENSOR
(See Fig. 7-7-7.)

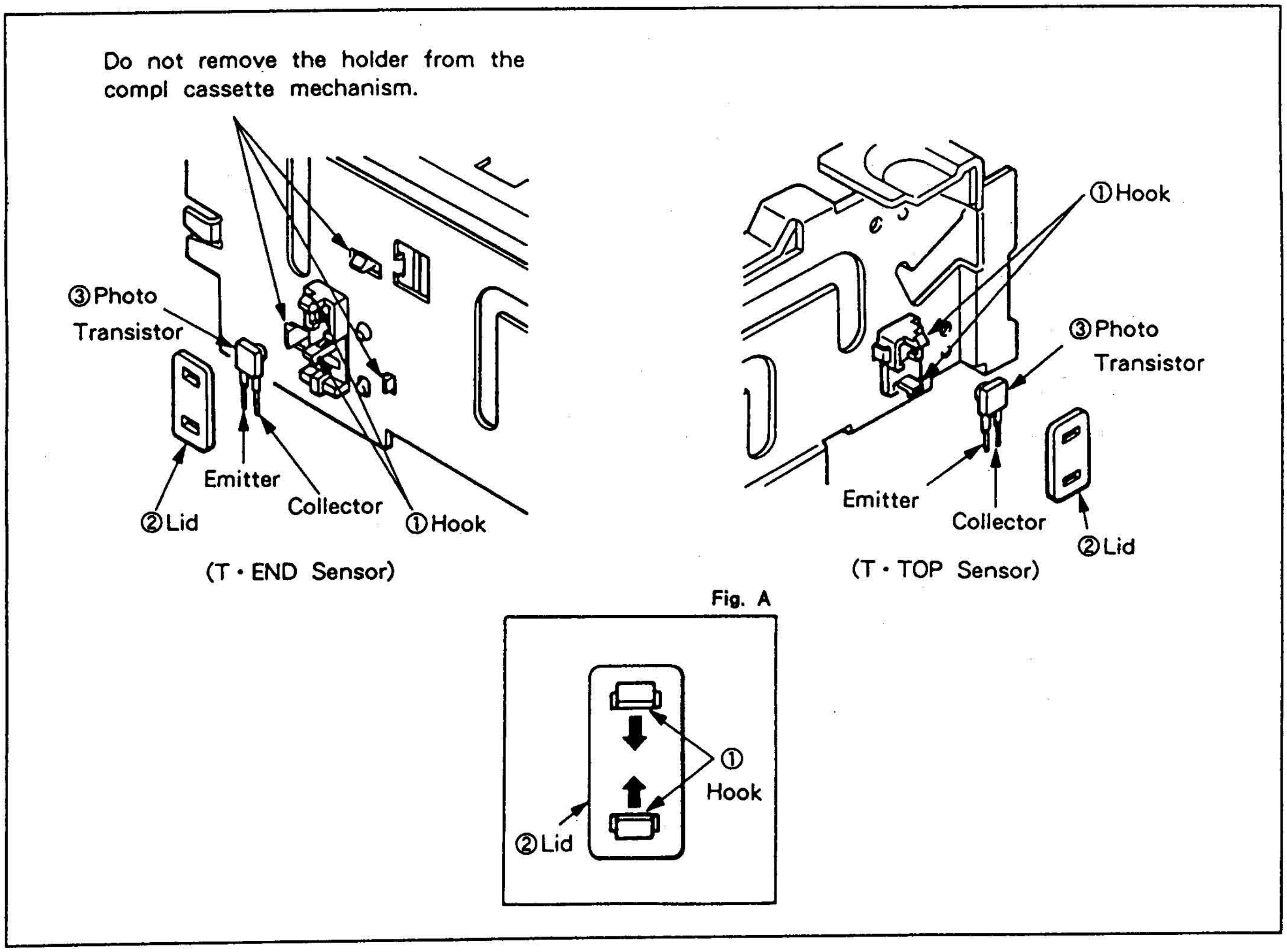
1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in P.101.
2) When removing the T-TOP SENSOR, remove the GEAR BRACKET ASS'Y as instructed in P.88.
3) Unhook the hook ① as instructed in Fig. A, then remove the LID ②. Take care not to push the hook ① too much, otherwise it may be deformed or broken.
4) Remove the photo transistors ③, then remove the lead wires.

Note: Mounting position of the transistor holder on the T-END SENSOR side is precisely adjusted at the factory, so never remove it from the COMPL CASSETTE MECHANISM.

2. Remounting

1) Solder the brown lead wire to the emitter side, and the red lead wire to the collector side of the T-TOP SENSOR photo transistor ③.
Solder the orange lead wire to the emitter side, and the yellow lead wire to the collector side of the T-END SENSOR photo transistor.
2) Mount the photo transistors ③ onto their respective holders.
3) Mount the LID ② and fix it with the hook ①.
4) Mount the GEAR BRACKET ASS'Y as instructed in P.102.
5) Mount the COMPL CASSETTE MECHANISM as instructed in P.101.


Do not remove the holder from the compl cassette mechanism.
③Photo Transistor
Emitter
Collector
②Lid
①Hook
①Hook
③Photo Transistor
Emitter
Collector
②Lid
①
Hook
②Lid

(T • END Sensor)

(T • TOP Sensor)

Fig. A

Fig. 7-7-7. T TOP Sensor & T END Sensor

7-7-3.COMPL Holder Motor (Loading Motor Block)

(1) COMPL Motor Bracket

1. Removal

1) Remove the PRE-AMP UNIT and the PRE-AMP. BRACKET as instructed in 7-7-1.
2) Remove the COMPL CASSETTE MECHANISM as instructed in P.101.
3) Remove the two screws ① and the other one ⑩, then remove the COMPL HOLDER MOTOR ② (See Fig. 7-7-8.)

2. Remounting

1) Set the mechanism chassis to the INITIAL mode. In this mode, look at the mechanism chassis INITIAL mode positioning alignment holes ③ just from above and align the MAIN CAM ④ and MODE CAM ⑤ INITIAL mode positioning alignment holes as shown in Fig. A.
2) Set the COMPL HOLDER MOTOR ② to the INITIAIL mode with the mode selector (VHJ-0050). In this position, the FRONT LOADING GEAR △ positioning alignment mark ⑥ is aligned with the MOTOR HOLDER INITAL mode positioning alignment mark ⑦ (see Fig. B.).
3) Align the ROTARY SWITCH (mode detector switch) ⑧ with the INITIAL mode positioning alignment mark ⑨ (see Fig. C.).
4) Line up COMPL HOLDER MOTOR ② with PROTUBERANCE ⑪ and POSITIONING ALIGNMENT HOLE ⑫, and attach with two screws ① and one screw. (See to Fig. 7-7-8.)
5) Mount the COMPL CASSETTE MECHANISM as instructed in P.101.
6) Mount the PRE-AMP UNIT and the PRE-AMP. BRACKET as instructed in 7-7-1.

Note: Normal mechanism operation cannot be achieved if initial positioning of the MAIN CAM ④, the MODE CAM ⑤ and the ROTARY SWITCH (mode detector switch) ⑧ are not performed precisely.

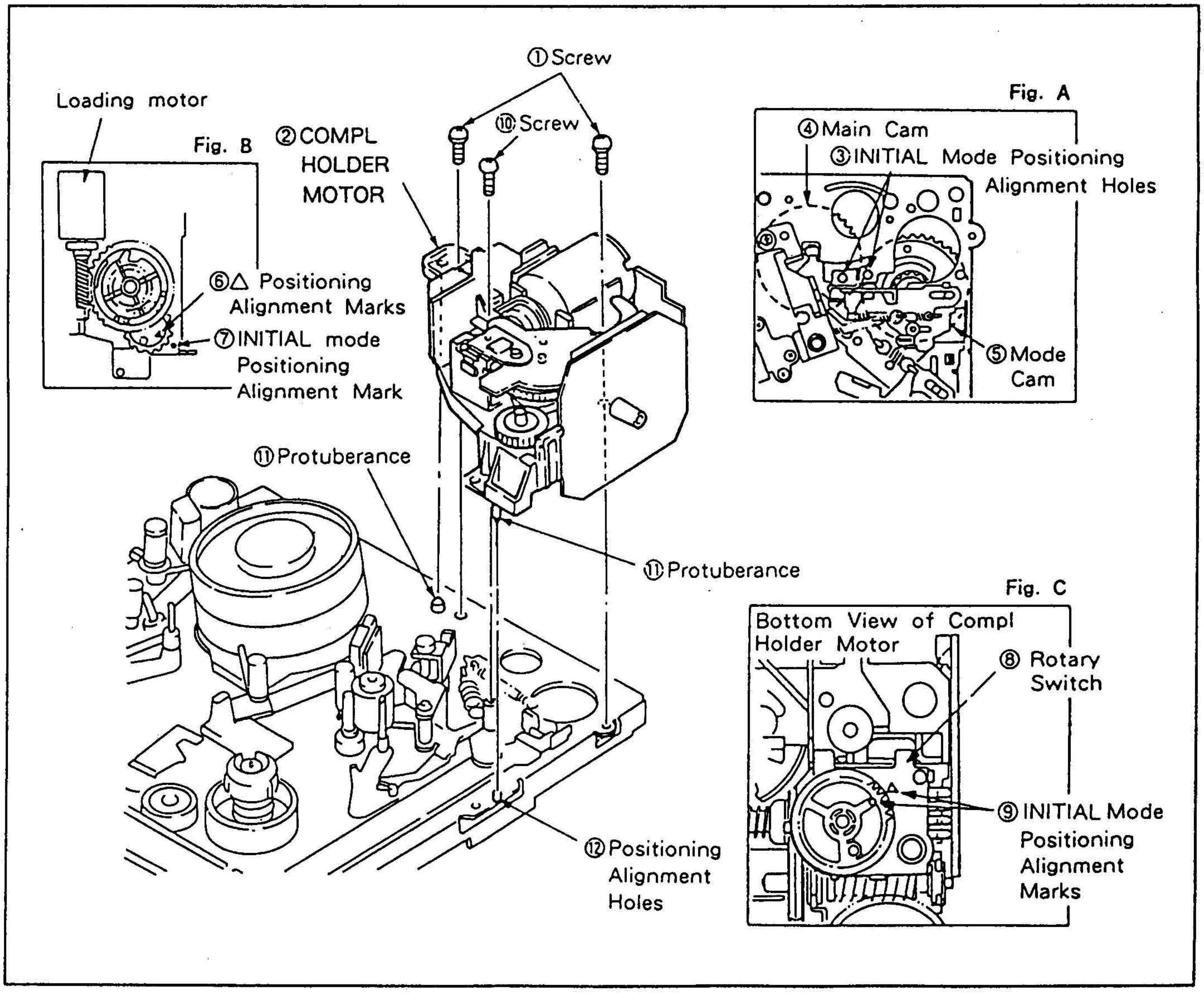

①Screw
⑩Screw
Loading motor
Fig. B
②COMPL HOLDER MOTOR
⑥△ Positioning Alignment Marks
⑦INITIAL mode Positioning Alignment Mark
⑪Protuberance
⑪Protuberance
⑫Positioning Alignment Holes
Fig. A
④Main Cam
③INITIAL Mode Positioning Alignment Holes
⑤Mode Cam
Fig. C
Bottom View of Compl Holder Motor
⑧ Rotary Switch
⑨INITIAL Mode Positioning Alignment Marks

Fig. 7-7-8. Compl Holder Motor

(2) LOADING MOTOR (See to Fig. 7-7-9)

1. Removal

LOADING MOTOR can be replaced after LOADING MOTOR BLOCK unit has been removed by referring to 7-7-8. The 1991 version of the mechanism allows LOADING MOTOR itself to be replaced without removing CASSETTE HOLDER BLOCK and LOADING MOTOR BLOCK. The following describes this procedure.

1) Use MODE SELECTOR (VHJ-0050) to set the mechanism to the INITIAL mode.
2) Remove the connector for DEW SENSOR connected to the MC-3 board ①.
3) Remove the three screws ② and remove the HOLDER BRACKET ④ with the FRONT WORM ASS'Y ③ still attached.
4) Remove the DAMPER ⑥ attached to the pulley of the LOADING MOTOR ⑤.
5) Remove the FRONT HELICAL GEAR ⑦ and WASHER ⑧.
6) Remove soldered LEAD WIRE from the terminal of LOADING MOTOR ⑤.
7) Remove the LOADING BELT ⑨.
8) Remove the LOADING MOTOR ⑤ by lifting up from the back terminal side.

2. Remounting

Before attaching the LOADING MOTOR ⑤ to the MOTOR HOLDER ⑩, confirm the DAMPER ⑪ and DAMPER ⑫ shown in Fig. 7-7-9. are in the proper position on MOTOR HOLDER ⑩.

1) The LOADING MOTOR ⑤ puts PROTUBERANCE ㉓ in the slit ㉔ of the MOTOR HOLDER ⑩. Further, mount the tap hole ⑬ at two points of the front pulley side so that the it is secured to the PROTUBERANCE ⑭ of the MOTOR HOLDER at two points.
2) Solder the lead wire from the MC-3 board to the LOADING MOTOR ⑤ terminal. (Solder the red lead wire to the positive terminal side.)
3) Hang the LOADING BELT ⑨ on the pulley.
4) After hanging the LOADING BELT ⑨ on the pulley, confirm that the mechanism unit is in the INITIAL mode. The initial mode is indicated by Fig. A of Fig. 7-7-9. and is the position in which INITIAL mode positioning alignment holes of the MAIN CAM ⑮ and MODE CAM ⑯ are lined up with the THROUGH HOLE ⑰ of the MOTOR HOLDER. If the INITIAL mode is not selected, adjust with MODE SELECTOR (VHJ-0050).
5) As shown in Fig. B, confirm the positions of the △ INITIAL positioning alignment mark on the FRONT LOAD GEAR ⑱ and INITIAL mode positioning alignment mark ⑲ position of the MOTOR HOLDER and the position relationship of the RACK ⑳.
6) Apply a light coat of grease to the entire sides of the AXLE ㉑ and FRONT HELICAL GEAR ⑦.
7) Attach the FRONT HELICAL GEAR ⑦ and WASHER ⑧ to the AXLE ㉑. As shown in Fig. C, the FRONT HELICAL GEAR ⑦ is attached so that the indent on the side is inside PIN ㉒ of the FRONT LEVER ASS'Y.
8) Attach the DAMPER ⑥ to the LOADING MOTOR ⑤ pulley.
9) The HOLDER BRACKET ④ is attached by engaging the FRONT WORM ASS'Y ③ with the LOADING MOTOR ⑤ pulley, and held in place with three screws ②.
10) Attach the connector of DEW SENSOR ㉕ to the MC-3 board ① and return the mechanism to the eject completion using MODE SELECTOR.

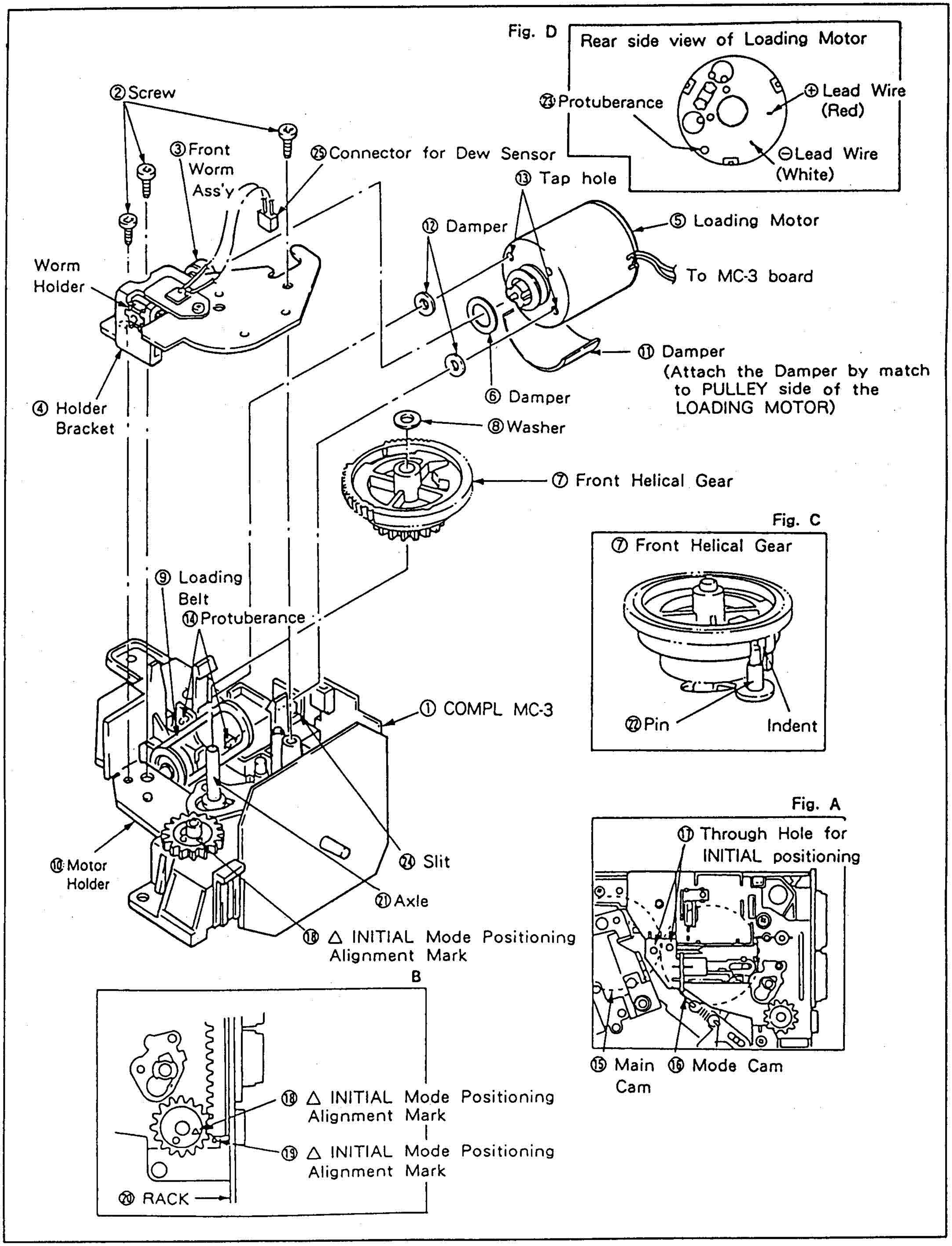


Fig. D
Rear side view of Loading Motor
㉓ Protuberance
⊕ Lead Wire (Red)
⊖ Lead Wire (White)
② Screw
③ Front Worm Ass'y
㉕ Connector for Dew Sensor
⑬ Tap hole
⑫ Damper
⑤ Loading Motor
To MC-3 board
Worm Holder
⑪ Damper
(Attach the Damper by match to PULLEY side of the LOADING MOTOR)
⑥ Damper
④ Holder Bracket
⑧ Washer
⑦ Front Helical Gear
Fig. C
⑦ Front Helical Gear
㉒ Pin
Indent
⑨ Loading Belt
⑭ Protuberance
① COMPL MC-3
Fig. A
⑰ Through Hole for INITIAL positioning
⑩ Motor Holder
㉔ Slit
㉑ Axle
⑱ △ INITIAL Mode Positioning Alignment Mark
B
⑮ Main Cam
⑯ Mode Cam
⑱ △ INITIAL Mode Positioning Alignment Mark
⑲ △ INITIAL Mode Positioning Alignment Mark
⑳ RACK

Fig. 7-7-9. Loading Motor

7-7-4.Tape Loading Mechanism

(1) MAIN PARTS OF THE TAPE LOADING MECHANISM (See Fig. 7-7-10)

1. Removal

1) Remove connectors from the DRUM MOTOR board (SV-5).
2) Remove the three screws ①, then remove the REINFORCE BRACKET ②.
3) Remove the two special washers ③, then remove the LOAD RACK ④.
4) Remove the special washer ⑤, then remove the CAM LOAD LEVER ASS'Y ⑥.
5) Remove the special washer ⑦, then remove the MAIN CAM ⑧.
6) Unhook the LOAD GEAR T hook ⑩, then remove the LOAD GEAR T ⑨ as shown in Fig. A, with the SPRING COIL ⑪ and the LOAD LEVER ASS'Y T ⑫ attached to it.
7) Unhook the LOAD GEAR S hook ⑭, then remove the LOAD GEAR S ⑬ as shown in Fig. B, with the SPRING COIL ⑮ and the LOAD LEVER ASS'Y S ⑯ attached to it.

Note: Take care not to open the LOAD GEAR hooks too much, otherwise they may be deformed or broken. If they are, replace them.

2. Remounting

1) Apply grease to the hole ⑰ of the LOAD LEVER ASS'Y S ⑯, as shown in Fig. B.
2) Apply grease to the hole ㉒ of the LOAD LEVER ASS'Y T ⑫ as shown in Fig. A, and to the sections of the LOAD GEAR T ⑨ as indicated with an arrow in Fig. C.
3) Apply grease to GROOVE 1, GROOVE 2 and to the outer side of the MAIN CAM ⑧, shown in Fig. E.
4) Apply grease to the three oval holes of the LOAD RACK ④ as shown in Fig. D.
5) Apply grease to the outer surface of axles ⑲, ⑳, ㉖ and ㉘.
6) After assembling as shown in Fig. B, mount the LOAD GEAR S ⑬ onto the axle ⑲. Insert the ROLLER BASE S pin ⑱ into the hole ⑰ of the LOAD LEVER ASS'Y S.
7) After assembling as shown in Fig. A, mount the LOAD GEAR T ⑨ onto the axle ⑳. When doing so, align the INITIAL mode positioning alignment holes ㉑ of the LOAD GEAR S ⑬ and the LOAD GEAR T ⑨ to the INITIAL mode position. Insert the ROLLER BASE T pin ㉓ into the hole ㉒ of the LOAD LEVER ASS'Y T ⑫.
8) Mount the MAIN CAM ⑧ onto the axle ㉖. At that time, make sure that the INITIAL mode positioning alignment holes ㉕ of the MAIN CAM ⑧ and the MODE CAM ㉔ match the INITIAL mode positioning alignment holes ㉞ of the MECHANISM CHASSIS. Also check to be sure that the pin ㉗ of the CAM PINCH LEVER ASS'Y is put in the GROOVE 1 of the MAIN CAM as shown in Fig. E.
9) Mount the special washer ⑦ onto the axle ㉖.
10) Mount the CAM LOAD LEVER ASS'Y ⑥ onto the axle ㉘. Insert the pin ㉙ into the MAIN CAM GROOVE 2 as shown in Fig. E.
11) Mount the special washer ⑤ onto the axle ㉘.
12) Set the INITIAL mode positioning alignment marks ㉚ of the LOAD RACK ④ and the LOAD GEAR T ⑨ to the INITIAL mode position, and mount onto the two axles ㉛. Insert the CAM LOAD LEVER ASS'Y pin ㉝ into the hole ㉜.
13) Mount the two special washers ③ onto the two axles ㉛.
14) Mount the REINFORCE BRACKET ② with the three screws ①.
15) Insert the connector into the DRUM MOTOR board (SV-5).
16) Confirm that loading and unloading are performed smoothly.

Note: Be sure to perform INITIAL mode positioning of cams and gears precisely.

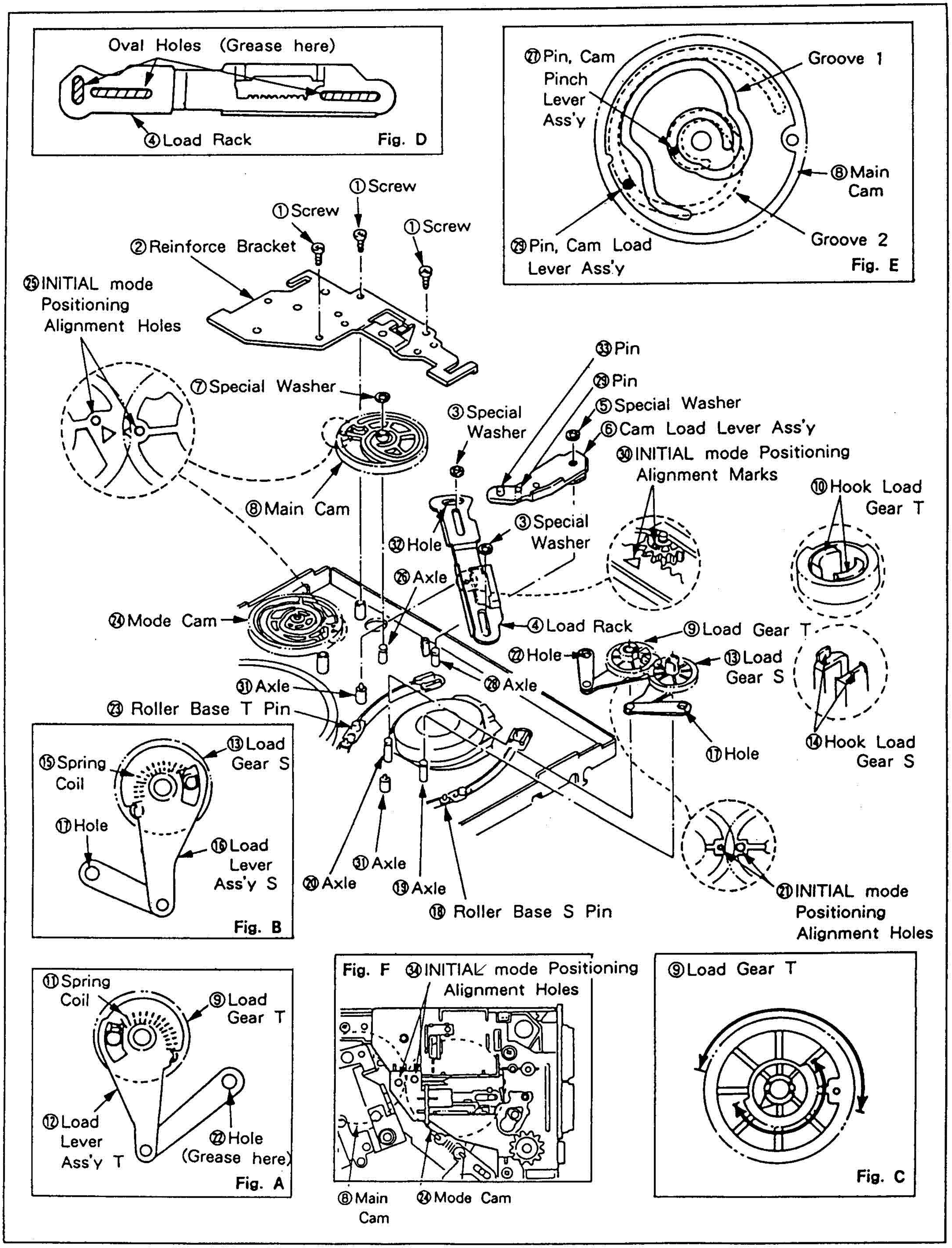

Oval Holes (Grease here)
④Load Rack
Fig. D
㉗Pin, Cam Pinch Lever Ass'y
Groove 1
⑧Main Cam
Groove 2
㉙Pin, Cam Load Lever Ass'y
Fig. E
①Screw
①Screw
①Screw
②Reinforce Bracket
㉕INITIAL mode Positioning Alignment Holes
⑦Special Washer
⑧Main Cam
㉝Pin
㉙Pin
⑤Special Washer
③Special Washer
⑥Cam Load Lever Ass'y
㉚INITIAL mode Positioning Alignment Marks
⑩Hook Load Gear T
㉜Hole
③Special Washer
㉖Axle
㉔Mode Cam
④Load Rack
⑨Load Gear T
㉒Hole
⑬Load Gear S
㉛Axle
㉘Axle
㉓ Roller Base T Pin
⑰Hole
⑭Hook Load Gear S
⑮Spring Coil
⑬Load Gear S
⑰Hole
⑯Load Lever Ass'y S
Fig. B
⑳Axle
㉛Axle
⑲Axle
⑱ Roller Base S Pin
㉑INITIAL mode Positioning Alignment Holes
⑪Spring Coil
⑨Load Gear T
⑫Load Lever Ass'y T
㉒Hole (Grease here)
Fig. A
Fig. F
㉞INITIAL mode Positioning Alignment Holes
⑧Main Cam
㉔Mode Cam
⑨Load Gear T
Fig. C

Fig. 7-7-10. Loading Mechanism Main Parts

(2) MODE CAM (See Fig. 7-7-11.)

1. Removal

1) Set the INITIAL mode with the mode selector (VHJ-0050).
2) Remove the REINFORCE BRACKET as instructed in P.110.
3) Remove the two special washers ①, then remove the CAM PLATE SLIDE ASS'Y ②.
4) Remove the MODE CAM ③.

2. Remounting

1) Seering P.110., confirm that the MAIN CAM is in the INITIAL mode position.
2) In case the MAIN CAM is misplaced, use the mode selector (VHJ-0050) to align the MAIN CAM positioning hole with the chassis INITIAL mode position hole (See P.110. for the INITIAL mode position). Since the ROTARY SWITCH (mode detector switch) does not rotate, the mode selector indicator lamp will not show the correct mode.
3) Align the ROTARY SWITCH (mode detector switch) ④ with the INITIAL mode positioning alignment mark ⑤ as shown in Fig. A.
4) Mount the MODE CAM ③ onto the axle ⑥. Do it so that the SLIDE CAM ASS'Y pin ⑪ is placed in the GROOVE 3 as shown in Fig. B.
5) Mount the CAM PLATE SLIDE ASS'Y ② onto the axles ⑥ and ⑦. Do it so that the pin ⑧ gets into the GROOVE 4 of the MODE CAM as shown in Fig. B, and the point of the bent-up part ⑨ into the ACT PLATE SLIDE ASS'Y hole ⑩.
6) Mount the two special washers ① onto the axles ⑥ and ⑦.
7) Mount the REINFORCE BRACKET as instructed in P.110.

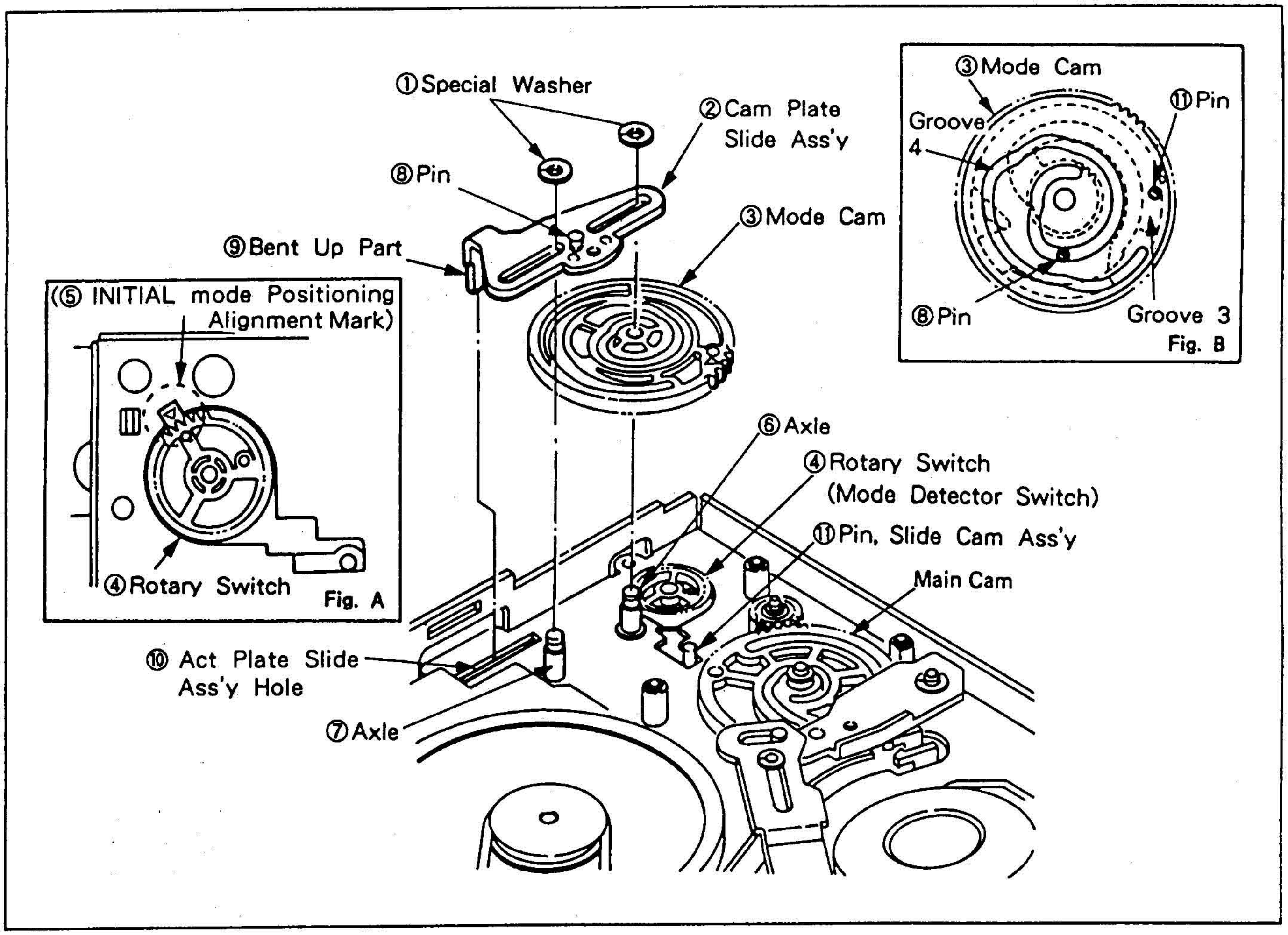

①Special Washer
②Cam Plate Slide Ass'y
⑧Pin
③Mode Cam
⑨Bent Up Part
(⑤ INITIAL mode Positioning Alignment Mark)
④Rotary Switch
Fig. A
⑥Axle
④Rotary Switch (Mode Detector Switch)
⑪Pin, Slide Cam Ass'y
Main Cam
⑩ Act Plate Slide Ass'y Hole
⑦Axle
③Mode Cam
Groove 4
⑪Pin
⑧Pin
Groove 3
Fig. B

Fig. 7-7-11. Mode Cam

7-7-5.COMPL Head Bracket (ACE Head)(See Fig. 7-7-12.)

1. Removal
1) Remove the special nut ②.
2) Remove the SLEEVE ③ the COMPL HEAD BRACKET ① and the SPRING COIL ④, in that order.

Note: Take care not to scratch or soil the ACE head surface.

2. Remounting
1) Apply grease to the axle ⑥ as shown in Fig. A.
2) Apply grease to the spot where the COMPL HEAD BRACKET ① makes contact with the STOPPER ⑦.
3) Mount the SPRING COIL ④ and the COMPL HEAD BRACKET ①, in that order, onto the axle ⑥. Hook one end of the SPRING COIL ④ to the notch ⑤, and the other end to the COMPL HEAD BRACKET, so that the COMPL HEAD BRACKET is pressed against the STOPPER ⑦.
4) Mount the special nut ② onto the axle ⑥ through the SLEEVE ③.
5) Clean the ACE head surface with a chamois leather moistened with methyl alcohol.
6) Perform ACE head adjustment as instructed in 7-4.

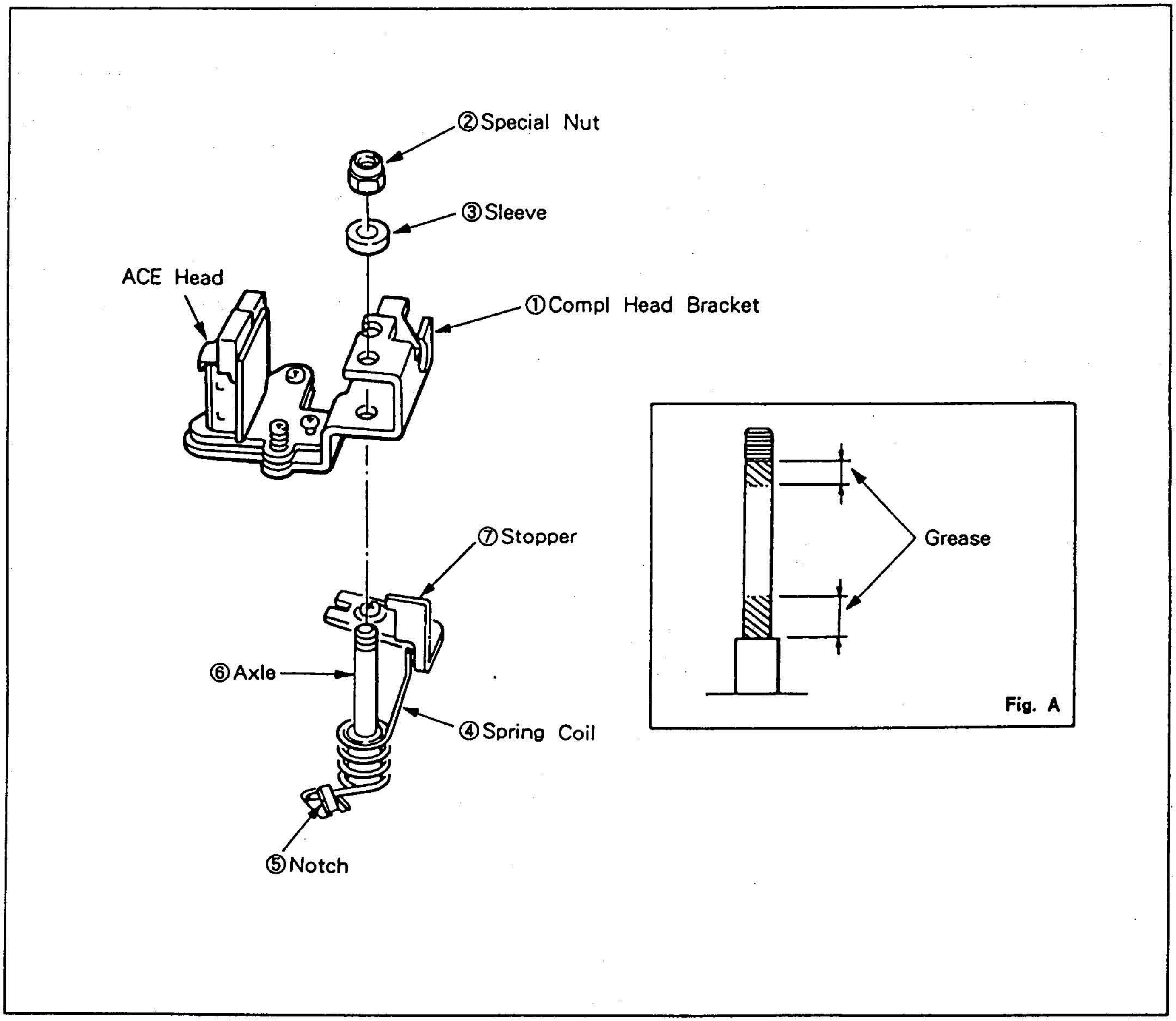

②Special Nut
③Sleeve
ACE Head
①Compl Head Bracket
⑦Stopper
⑥Axle
④Spring Coil
⑤Notch
Grease
Fig. A

Fig. 7-7-12. Compl Head Bracket(ACE Head)

7-7-6.Pinch Roller Pressure Mechanism (See Fig. 7-7-13.)

1. Removal
1) Remove the COMPL CASSETTE MECHANISM as instructed in P.101.
2) Remove the COMPL HEAD BRACKET as instructed in 7-7-5.
3) Remove the PINCH SPRING COIL ①.
4) Remove the special washer ②, then remove the PINCH LEVER ASS'Y ③.
5) Remove the REV GUIDE LEVER SPRING COIL ④.
6) Remove REV GUIDE LEVER ASS'Y ⑥ from the hook ⑤ of the plastic bearing on the bottom side. Use a jig VHJ-0073 shown in Fig. 7-7-14. to widen the hook of the plastic bearing. By so doing, the above removal of the REV GUIDE LEVER ASS'Y ⑥ can be made more easily. Care should be taken to avoid pushing the jig VHJ-0073 too much. Pushing it too hard may damage the hook in an extreme case.
7) Remove the SLIDE BRAKE SPRING COIL ⑦.
8) Remove the special washer ⑧, then remove the PINCH CAM LEVER ASS'Y ⑨.
9) Remove the ACT PINCH SLIDE ASS'Y ⑩.

Note: If the hook ⑤ of the plastic bearing is damaged, reference should be made to Section 3. "Method of Repairing the Bearing Section of REV GUIDE LEVER ASS'Y".

2. Remounting
1) Apply grease to pins ⑫/⑬ and axles ⑯/⑱.
2) Apply grease to the ACT PINCH SLIDE ASS'Y pin ⑰.
3) Set the INITIAL mode with the mode selector (VHJ-0050).
4) Mount the ACT PINCH SLIDE ASS'Y ⑩ onto pins ⑫ and ⑬.
5) Insert the pin ⑭ of the PINCH CAM LEVER ASS'Y ⑨ into the MAIN CAM ⑪ GROOVE 1, and mount onto the axle ⑯ while inserting the ACT PINCH SLIDE ASS'Y pin ⑰ of the ACT PINCH SLIDE ASS'Y into the hole ⑮.
6) Mount the special washer ⑧ onto the axle ⑯.
7) Hook the SLIDE BRAKE SPRING COIL ⑦ to the plastic pin ⑲.
8) Mount the REV GUIDE LEVER ASS'Y ⑥ to the plastic molding bearing, then fix it with the hook ⑤ at the bottom.
9) Hook the REV GUIDE LEVER SPRING COIL ④.
10) Mount the PINCH LEVER ASS'Y ③ to the axle ⑱.
11) Mount the special washer ② to the axle ⑱.
12) Hook the PINCH SPRING COIL ① between the ACT PINCH SLIDE ASS'Y ⑩ and the PINCH LEVER ASS'Y ③.
13) Mount the COMPL HEAD BRACKET as instructed in 7-7-5.
14) Mount the COMPL CASSETTE MECHANISM as instructed in P.101.
15) Perform ACE head adjustment as instructed in 7-4.

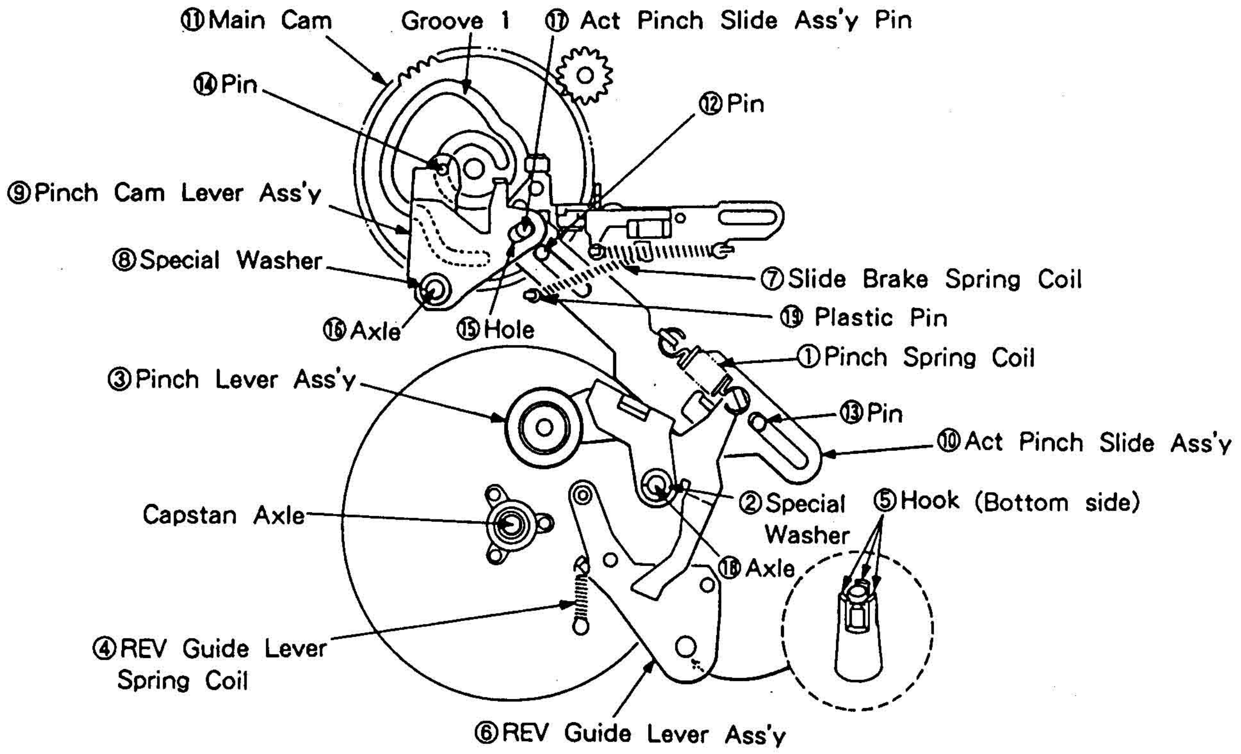
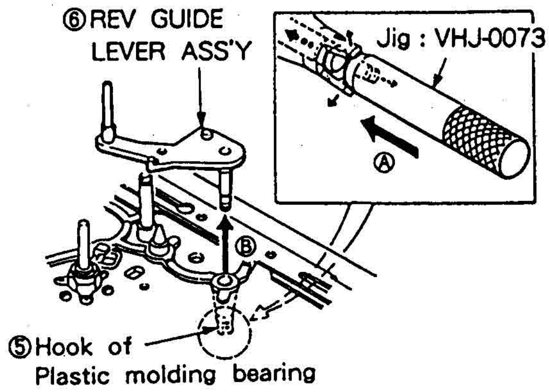

⑪Main Cam
Groove 1
⑰ Act Pinch Slide Ass'y Pin
⑭Pin
⑫Pin
⑨Pinch Cam Lever Ass'y
⑧Special Washer
⑦Slide Brake Spring Coil
⑲ Plastic Pin
⑯Axle
⑮Hole
①Pinch Spring Coil
③Pinch Lever Ass'y
⑬Pin
⑩Act Pinch Slide Ass'y
Capstan Axle
②Special Washer
⑤Hook (Bottom side)
⑱Axle
④REV Guide Lever Spring Coil
⑥REV Guide Lever Ass'y

Fig. 7-7-13. Pinch Roller Pressure Mechanism


⑥REV GUIDE LEVER ASS'Y
Jig : VHJ-0073
Ⓐ
Ⓑ
⑤Hook of Plastic molding bearing

Remove REV GUIDE LEVER ASS'Y in the direction of arrow Ⓑ, pushing VHJ-0073 slightly in the direction of arrow Ⓐ.
Be careful not to damage the hook by pushing too much.

Fig. 7-7-14. Method of Using the jig VHJ-0073

3. Method of Repairing the Bearing Section of REV GUIDE LEVER ASS'Y

If the hook of the plastic molding bearing is damaged in the process of removing the REV GUIDE LEVER ASS'Y, proceed with the repair as follows:

1) Scrape the broken hook of the bearing section with a cutter knife and flatten it.
2) Insert the REV GUIDE LEVER ASS'Y in the bearing and fit a stopper washer in. The special washer to be used must be Part No. 3-735-755-01 WASHER (DIA.2.6). This special washer (part No. 3-735-755-01 WASHER (DIA.2.6)) is the same as that used on SUPPLY REEL ASS'Y or TAKE-UP REEL ASS'Y.

Remove the REV GUIDE LEVER ASS'Y toward an arrow B while pushing the jig VHJ-0073 lightly in the direction of an arrow.
Pushing the jig VHJ-0073 too much may cause hook breakage. Therefore, care should be taken.

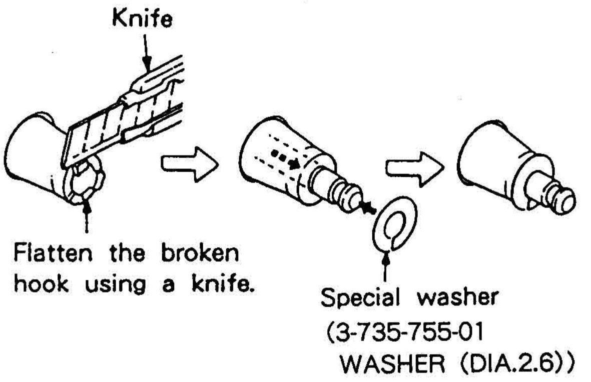

Knife
Flatten the broken hook using a knife.
Special washer
(3-735-755-01
WASHER (DIA.2.6))

Fig. 7-7-15. Method of Repairing the Bearing Section of the REV GUIDE LEVER ASSEMBLY

7-7-7.Brake Mechanism

(1) SUB TAKE-UP BRAKE ASS'Y
(See Fig. 7-7-16.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in P.101.
2) Remove the SPRING COIL ①.
3) While pushing the hook ② in the direction of arrow, remove the SUB TAKE-UP BRAKE ASS'Y ③.

2. Remounting

1) Mount the SUB TAKE-UP BRAKE ASS'Y ③ onto the pin ④. Confirm that the hook ② is firmly hooked to the chassis.
2) Fit the SPRING COIL between hooks ⑤ and ⑥.
3) Mount the COMPL CASSETTE MECHANISM as instructed in P.101.

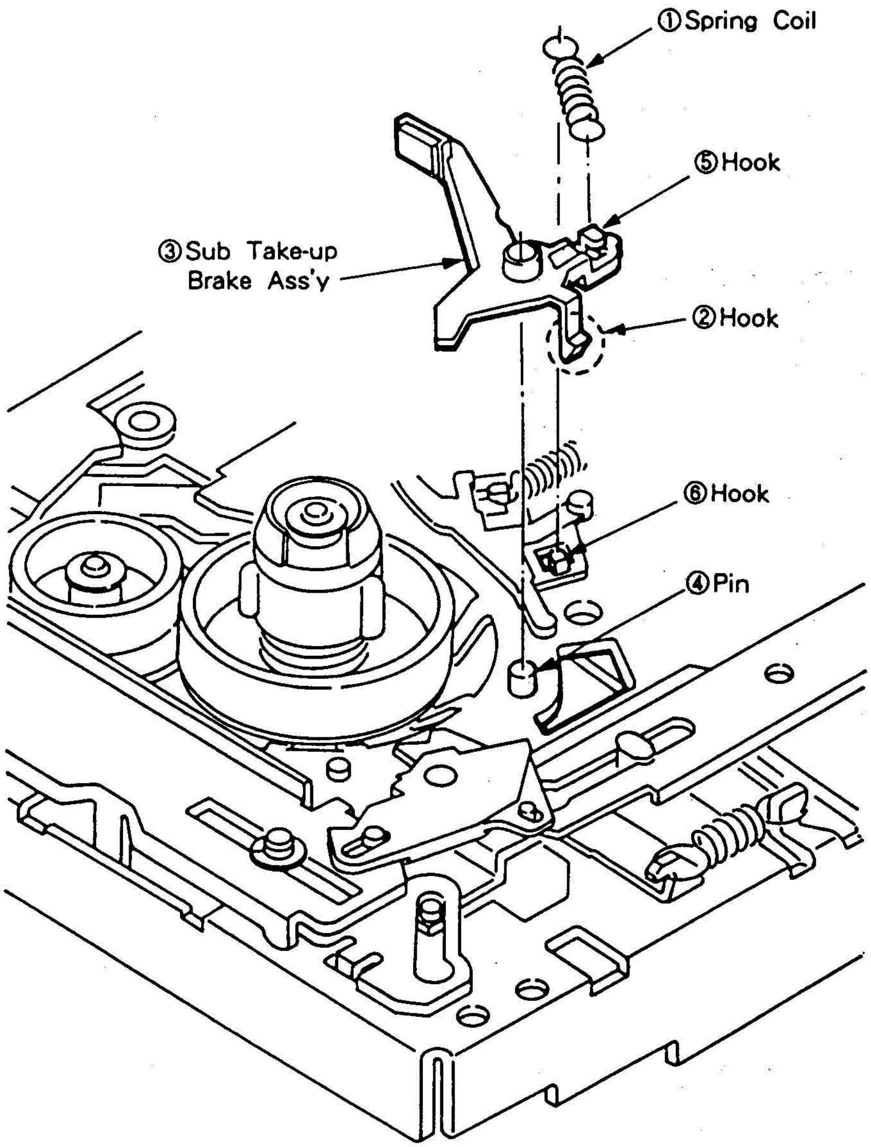

①Spring Coil
⑤Hook
③Sub Take-up Brake Ass'y
②Hook
⑥Hook
④Pin

Fig. 7-7-16. Sub Take-up Brake Ass'y

(2) SUPPLY BRAKE ASS'Y AND TAKE-UP BRAKE ASS'Y (See Fig. 7-7-17)

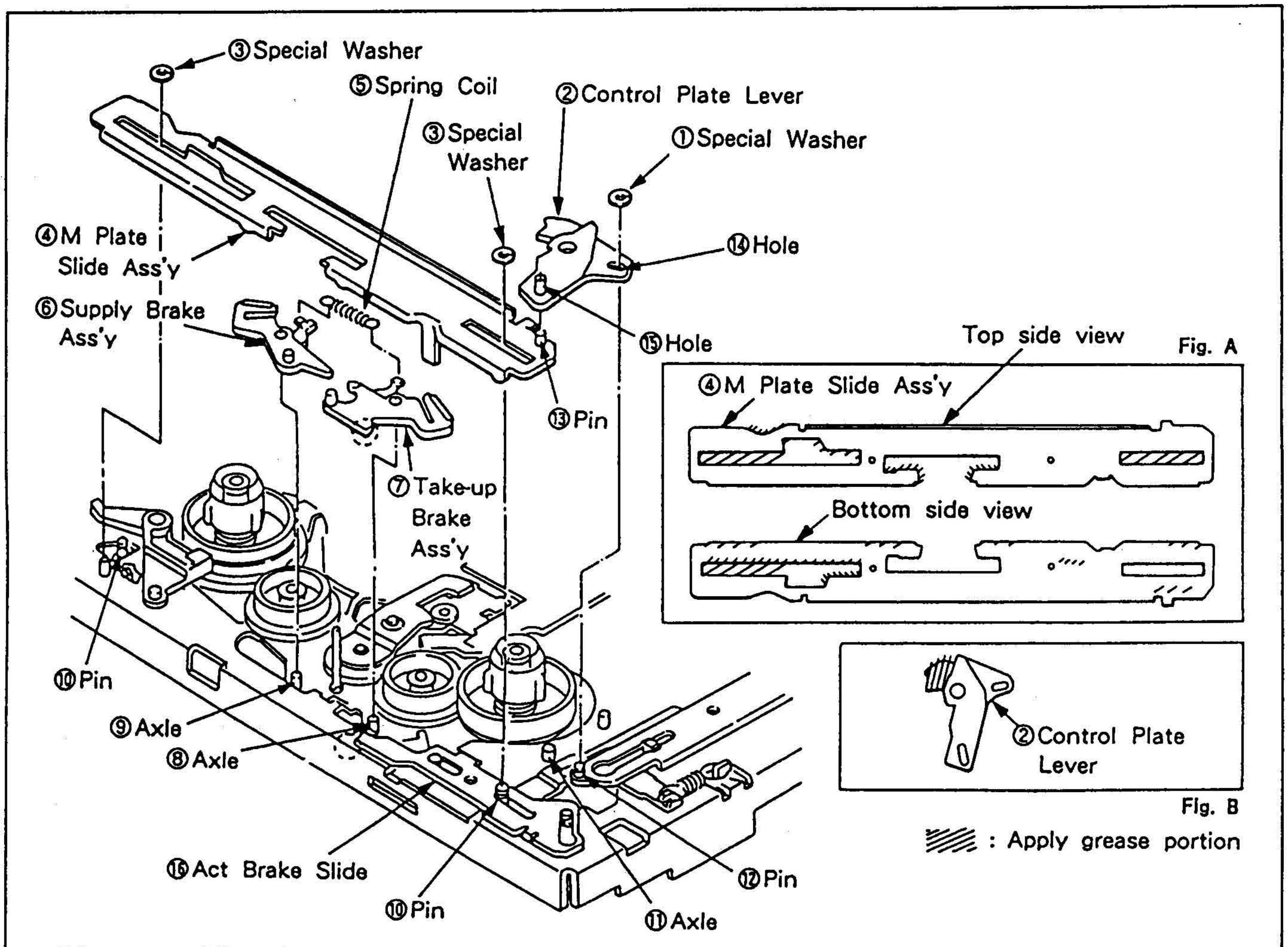
1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in P.101.
2) Remove the SUB TAKE-UP BRAKE as instructed in P.116.
3) Remove the special washer ①, then remove the CONTROL PLATE LEVER ②.
4) Remove the two special washers ③, then remove the M PLATE SLIDE ASS'Y ④.
5) Remove the SPRING COIL ⑤.
6) Remove the SUPPLY BRAKE ASS'Y ⑥ and the TAKE-UP BRAKE ASS'Y ⑦.

Note: Take care not to soil the brake shoes.

2. Remounting

1) Apply a thin layer of grease to axles ⑧ and ⑨.
2) Mount the TAKE-UP BRAKE ASS'Y ⑦ onto the axle ⑧.
3) Mount the SUPPLY BRAKE ASS'Y ⑥ onto the axle ⑨.
4) After applying a thin layer of grease to the M PLATE SLIDE ASS'Y ④ as shown in Fig. A, mount it onto the two pins ⑩.
5) Mount the two special washers ③ onto the two pins ⑩.
6) After applying grease to the CONTROL PLATE LEVER ② as shown in Fig. B, mount it onto the axle ⑪. Insert the pin ⑫ of the ACT PLATE SLIDE ASS'Y into the hole ⑭, and the pin ⑬ of M PLATE SLIDE ASS'Y into the hole ⑮.
7) Mount the special washer ① onto the pin ⑫.
8) Mount the SUB TAKE-UP BRAKE as instructed in P.116.
9) Mount the COMPL CASSETTE MECHANISM as instructed in P.101.


③Special Washer
⑤Spring Coil
②Control Plate Lever
③Special Washer
①Special Washer
④M Plate Slide Ass'y
⑭Hole
⑥Supply Brake Ass'y
⑮Hole
Top side view
Fig. A
④M Plate Slide Ass'y
⑬Pin
⑦Take-up Brake Ass'y
Bottom side view
⑩Pin
⑨Axle
⑧Axle
②Control Plate Lever
Fig. B
▨ : Apply grease portion
⑯Act Brake Slide
⑫Pin
⑩Pin
⑪Axle

When assembling, the contact surfaces of Take-up Brake ⑦ and the Brake Slide ⑯ marked with ◌ should contact but not overlap each other.

Fig. 7-7-17. Supply Brake Ass'y & Take-up Brake Ass'y

(3) TENSION LEVER ASS'Y AND BAND HOLDER ASSY (See Fig. 7-7-18)

1. Removal

1) Remove the CASSETTE HOLDER MECHANISM as instructed in P.101.
2) Remove the SPRING COIL ①.
3) Remove the screw ③ and washer ⑭ fixing the BAND BRAKE BRACKET ASS'Y ②.
4) Push the SUB SUPPLY BRAKE ④ in the direction of the arrow, setting the BAND BRAKE BRACKET ASS'Y ② free.
5) Open the hook ⑤ a little and remove the TENSION LEVER ASS'Y ⑥. Take care not to open the hook ⑤ too much, otherwise it may be deformed or broken.
6) Remove the hook ⑦ of the BAND BRAKE BRACKET ASS'Y.
7) Remove the fixing washer ⑮ and then remove the SPRING COIL ⑯ and the BAND LEVER ASS'Y ⑰.

2. Remounting

1) Mount the SPRING COIL ⑯ and the BRAKE BAND LEVER ASS'Y ⑰ to the axle (21) with the fixing washer ⑮, inserting the both ends of the SPRING COIL ⑯ into the SPRING COIL holding holes ⑱ and ⑲.
2) Mount the BAND BRAKE BRACKET ASS'Y hook ⑦ into the TENSION LEVER ASS'Y hole ⑧. Insert the TENSION LEVER ASS'Y axle ⑨ into the plastic bearing hole ⑩ and confirm that the hook ⑤ is hooked.
3) While pushing the SUB SUPPLY BRAKE ④ in the direction of arrow A, wind the BAND BRAKE BRACKET ASS'Y ② around the side of the SUPPLY REEL ASS'Y ⑳.
4) Mount the BAND BRAKE BRACKET ASS'Y ② to the BRAKE BAND LEVER ASS'Y ⑰ with the screw ③ through the washer ⑭.
5) Hook the SPRING COIL ① between the hooks ⑪ and ⑫.
6) Perform TENSION POLE position adjustment as instructed in 7-3 (P.85).
7) Mount the CASSETTE HOLDER MECHANISM as instructed in P.101.

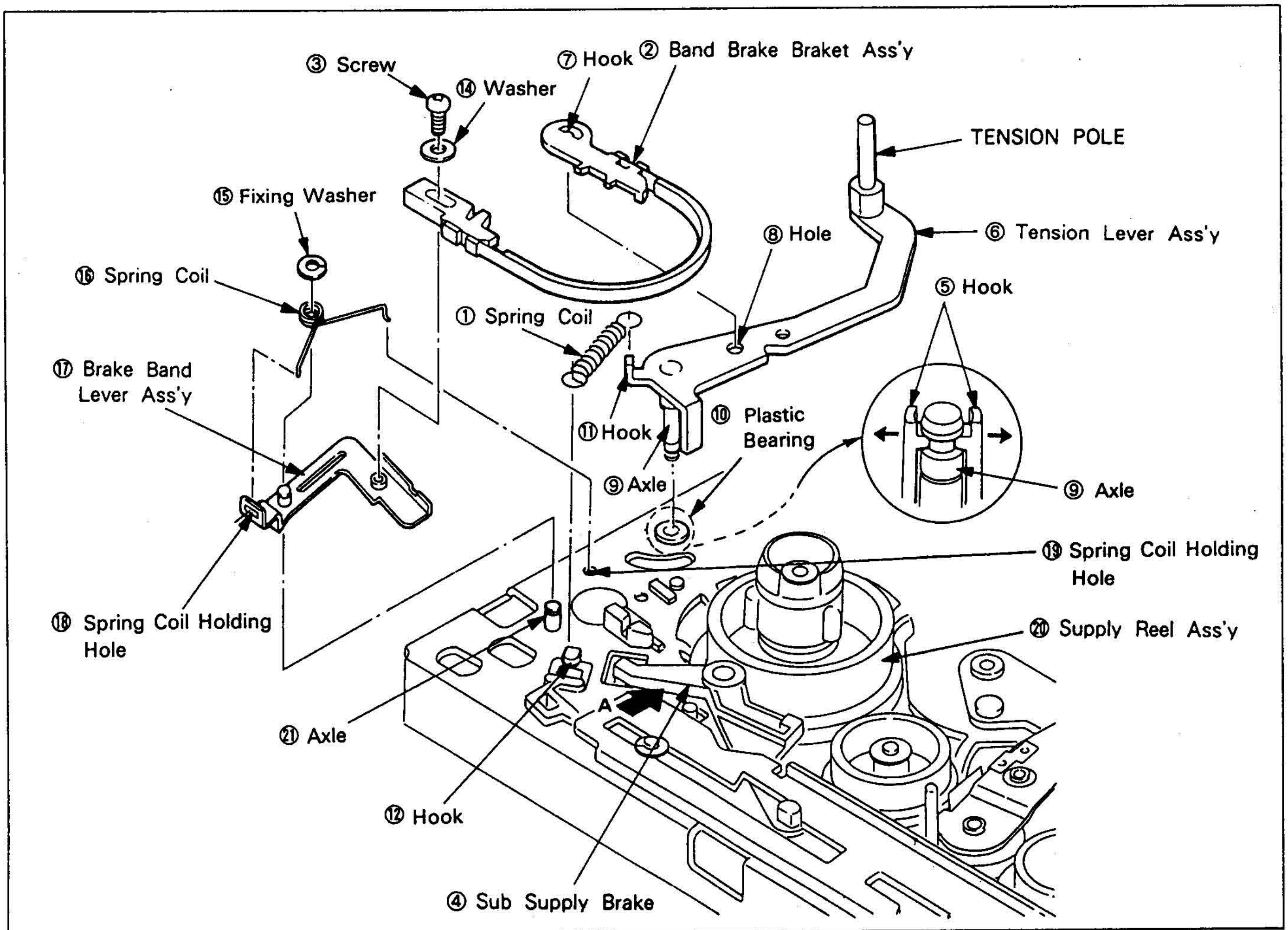

③ Screw
⑦ Hook
② Band Brake Braket Ass'y
⑭ Washer
TENSION POLE
⑮ Fixing Washer
⑧ Hole
⑥ Tension Lever Ass'y
⑯ Spring Coil
⑤ Hook
① Spring Coil
⑰ Brake Band Lever Ass'y
⑩ Plastic Bearing
⑪ Hook
⑨ Axle
⑨ Axle
⑲ Spring Coil Holding Hole
⑱ Spring Coil Holding Hole
⑳ Supply Reel Ass'y
A
㉑ Axle
⑫ Hook
④ Sub Supply Brake

Fig. 7-7-18. **Tension Lever Ass'y & Band Holder Ass'y**

(4) CAPSTAN BRAKE ASS'Y (See Fig. 7-7-19)

1. Removal
   1) Remove the SPRING COIL ①.
   2) Unhook the hook ②, then remove the CAPSTAN BRAKE ASS'Y ③.

2. Remounting
   1) Mount the CAPSTAN BRAKE ASS'Y ③ onto the axle ④. Confirm that the hook ② is hooked to the chassis.
   2) Hook the SPRING COIL ① between hooks ⑤ and ⑥. Fix the hook ⑥ side with adhesive (use an adhesive that allows later detaching).

Note: As for the model with two video heads, there are two types : one with the spring coil ① and CAPSTAN BRAKE ASS'Y ③ mounted, and one where these parts are not mounted.

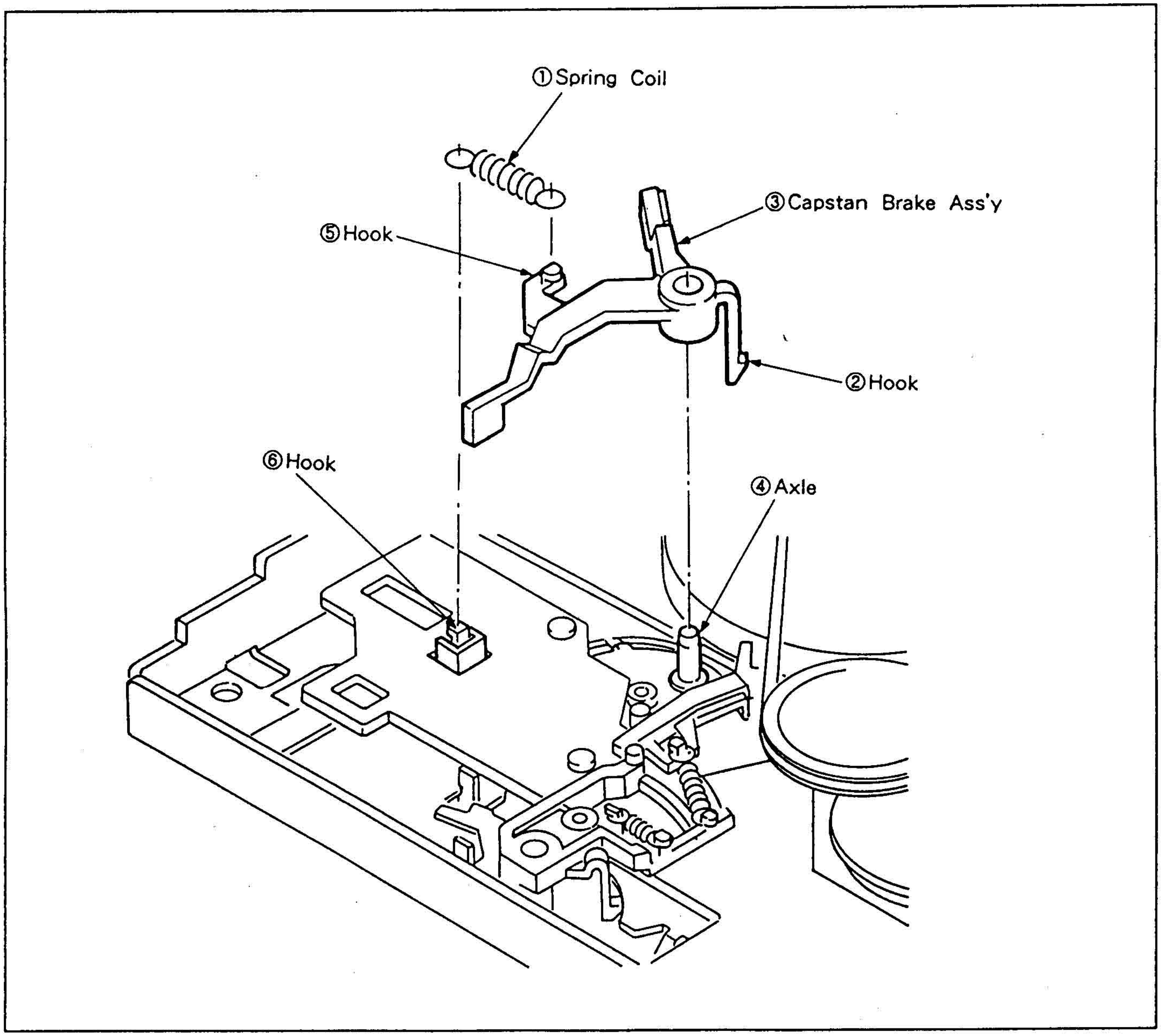


Fig. 7-7-19. Capstan Brake Ass'y

7-7-8.Reel Table Drive Mechanism

(1) SUPPLY REEL ASS'Y AND SUPPLY REEL GEAR (See Fig. 7-7-20.)

1. Removal
1) Remove the COMPL CASSETTE MECHANISM as instructed in P.101.
2) Remove the BAND HOLDER ASS'Y as instructed in P.118.
3) Set the PLAY mode with the mode selector (VHJ-0050).
4) Remove the special washer ①, then remove the SUPPLY REEL ASS'Y ② and the washer ③.
5) Remove the special washer ④.
6) While pushing the SUPPLY BRAKE ASS'Y ⑤ in the direction of arrow A, remove the SUPPLY REEL GEAR ⑥ and the washer ⑦.

Note: Be sure that no dirt gets on the section where both brake shoes make contact.

2. Remounting
1) Apply a little oil (less than one drop) to the part of the axle ⑧ indicated by the arrow B, then mount the washer ⑦.
2) While pushing the SUPPLY BRAKE ASS'Y ⑤ in the direction of arrow A, mount the SUPPLY REEL GEAR ⑥ onto the axle ⑧.
3) Mount the special washer ④ to the axle ⑧.
4) Apply 1 drop of oil to the part of the axle ⑨ indicated by the arrow C, then mount the washer ③.
5) Mount the SUPPLY REEL ASS'Y ② onto the axle ⑨.
6) Perform reel table height adjustment as instructed in P.83.
7) Mount the special washer ① onto the axle ⑨.
8) Mount the BAND HOLDER ASS'Y as instructed in P.118.
9) Perform tension pole position adjustment as instructed in 7-3.
10) Mount the COMPL CASSETTE MECHANISM as instructed in P.101.

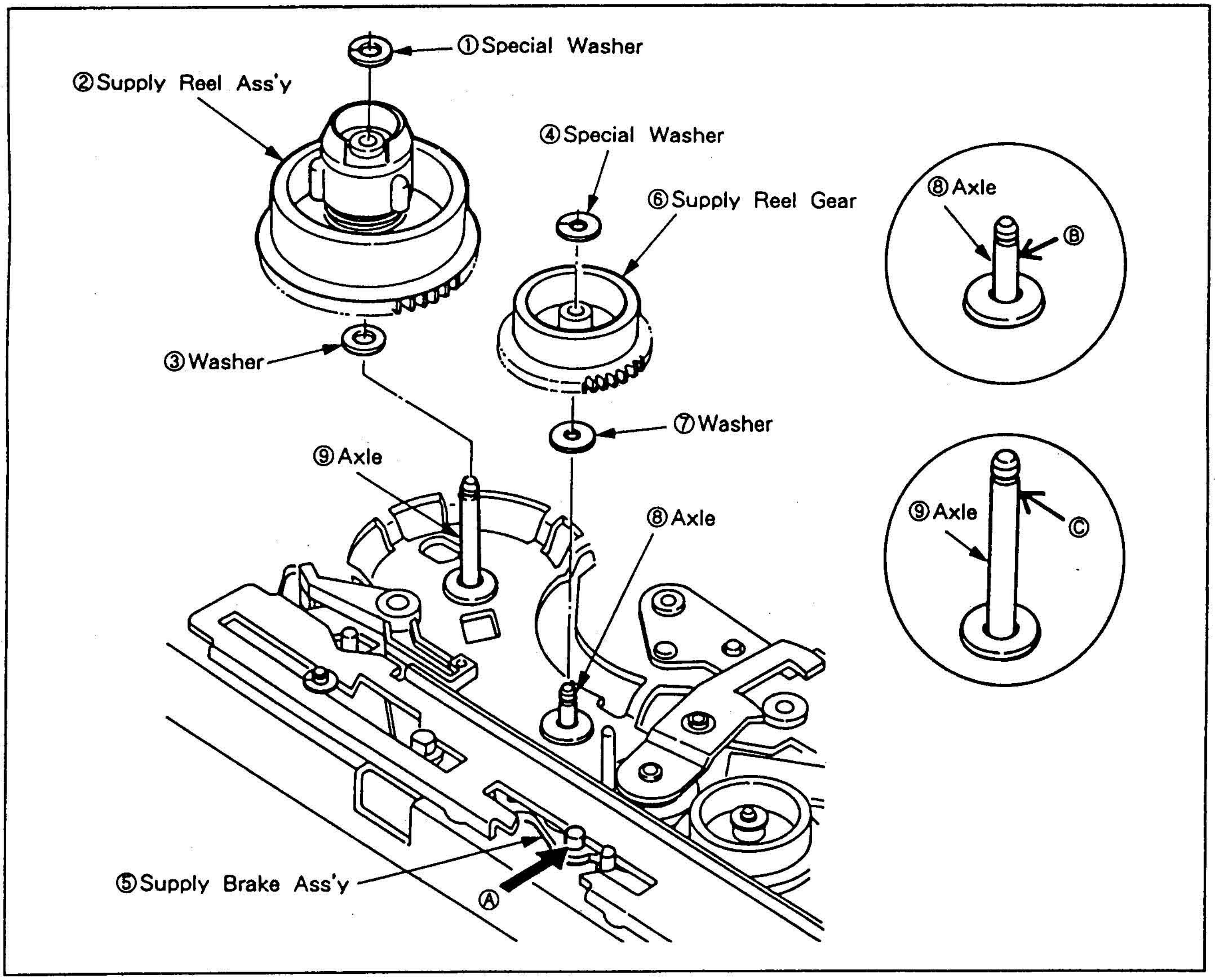


Fig. 7-7-20. Supply Reel Ass'y & Supply Reel Gear

(2) TAKE-UP REEL ASS'Y (See Fig. 7-7-21.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in P.101.
2) Remove the special washer ①.
3) Push the SUB TAKE-UP BRAKE ASS'Y ② in the direction of arrow A to release the brake, then remove the TAKE-UP REEL ASS'Y ③ and the washer ④.

Note: Be sure that no dirt gets on the section where both brake shoes make contact.

2. Remounting

1) Apply 1 drop of oil to the part of the axle ⑤ indicated by the arrow B, then mount the washer ④.
2) While pushing the SUB TAKE-UP BRAKE ASS'Y ② in the direction of arrow A, mount the TAKE-UP REEL ASS'Y ③ onto the axle ⑤.
3) Perform reel table height adjustment as instructed in 7-2.
4) Mount the special washer ① onto the axle ⑤.
5) Mount the COMPL CASSETTE MECHANISM as instructed in P.101.

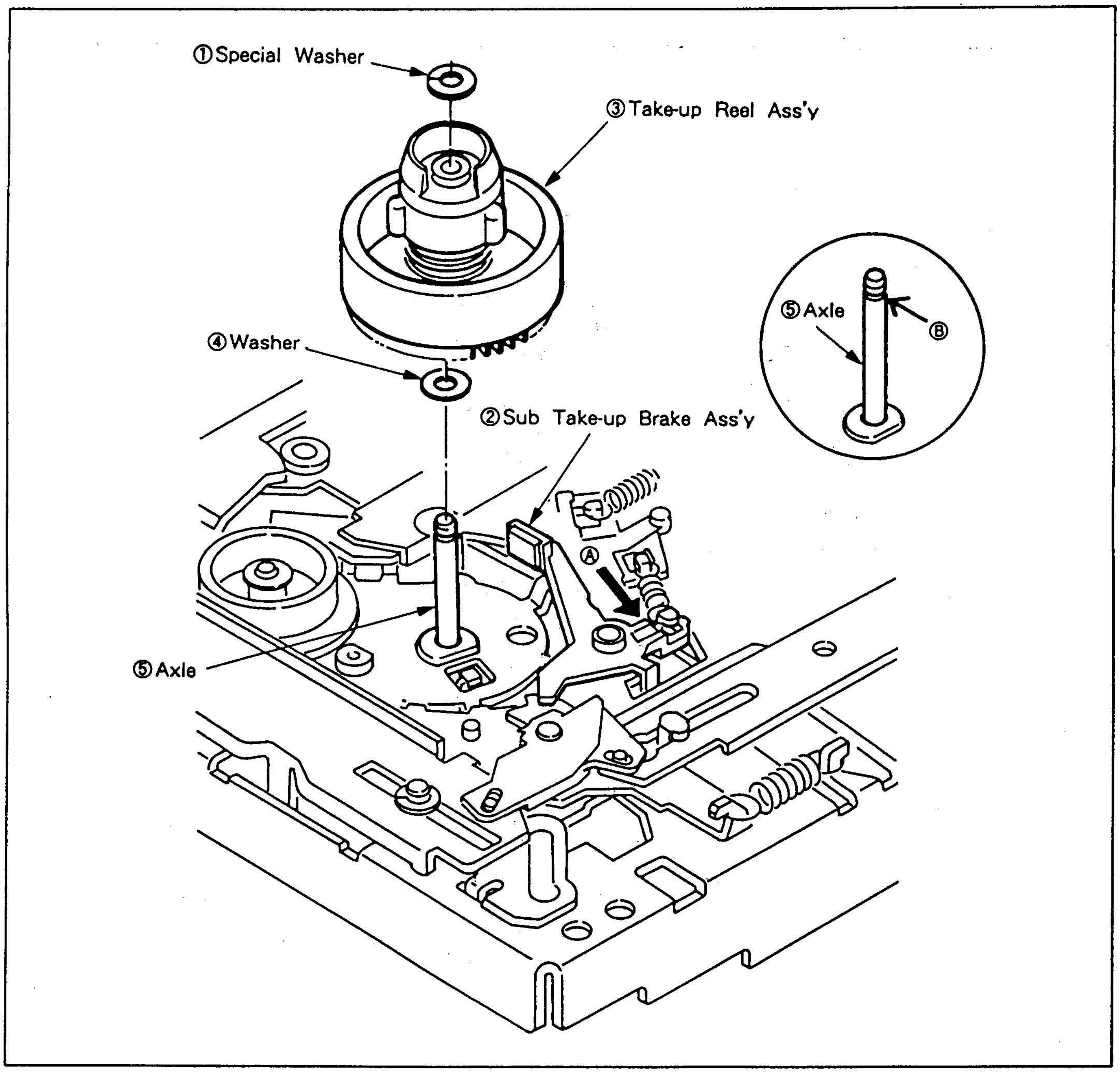


Fig. 7-7-21. Take-up Reel Ass'y

(3) TAKE-UP REEL GEAR (See Fig. 7-7-22.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in P.101.
2) Remove the TAKE-UP REEL ASS'Y as instructed in P.121.
3) Remove the SUB TAKE-UP BRAKE ASS'Y as instructed in P.116.
4) Remove the TAKE-UP BRAKE ASS'Y as instructed in P.117.
5) Remove the special washer ①, then remove the TAKE-UP REEL GEAR ③ and the washer ④.

2. Remounting

1) Apply a little oil (less than one drop) to the part of the axle ⑤ indicated with an arrow.
2) Mount the washer ④ and the TAKE-UP REEL GEAR ③ onto the axle ⑤.
3) Mount the special washer ① onto the axle ⑤.
4) Mount the TAKE-UP BRAKE ASS'Y as instructed in P.117.
5) Mount the SUB TAKE-UP BRAKE ASS'Y as instructed in P.116.
6) Mount the TAKE-UP REEL ASS'Y as instructed in P.121.
7) Mount the COMPL CASSETTE MECHANISM as instructed in P.101.

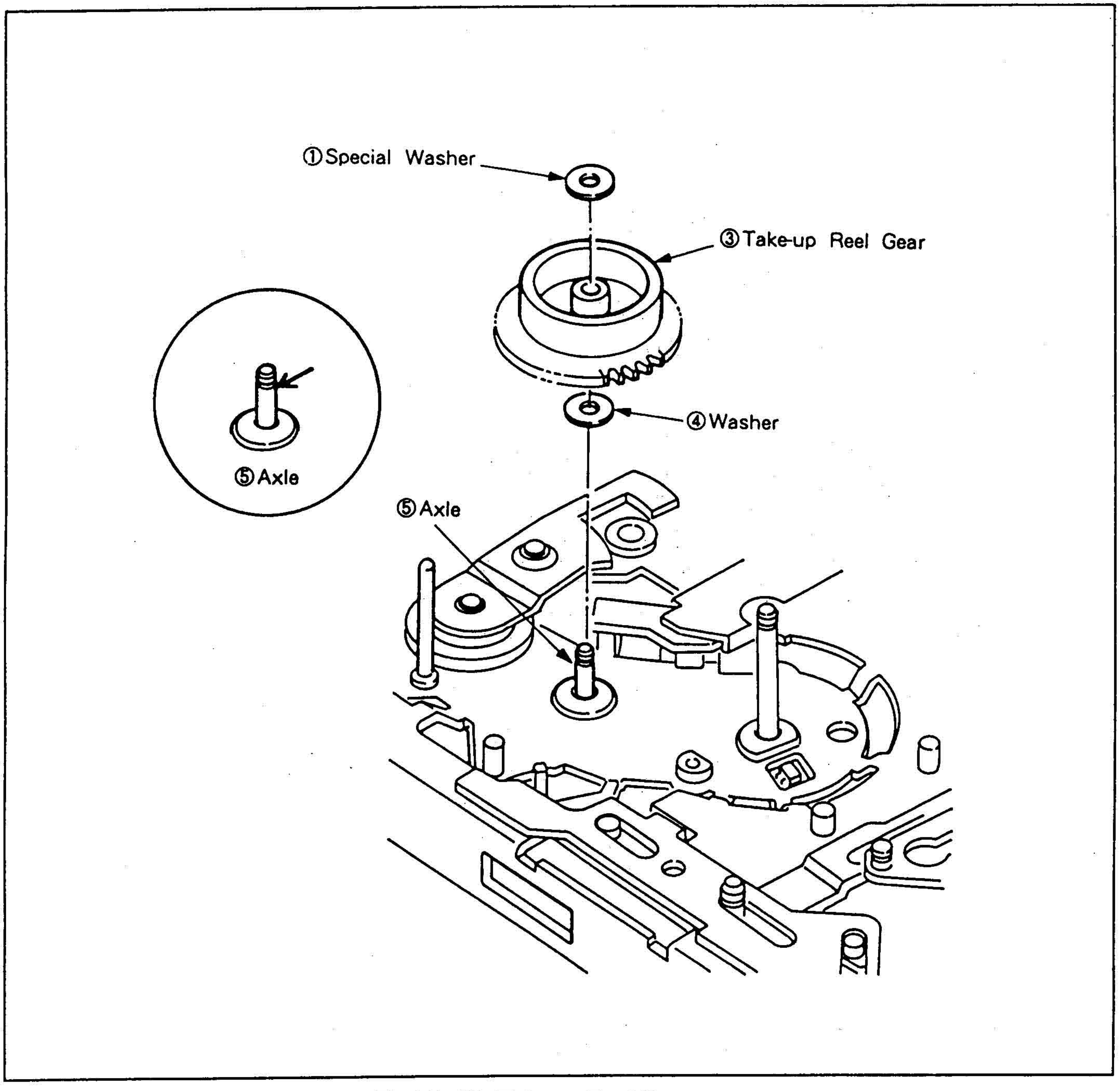


Fig. 7-7-22. Take-up Reel Geay

(4) REEL PULLEY AND FRICTION GEAR ASS'Y
(See Fig. 7-7-23.)

1. Removal

1) Remove the two screws ①, then remove the PULLEY BRACKET ②.
2) Remove the REEL DRIVE BELT ③.
3) Remove the special washer ④, then remove the REEL PULLEY ⑤.
4) Remove the special washer ⑥, then remove the FRICTION GEAR ASS'Y ⑦ and the washer ⑧.

Note: Some model may not incorporate the pulley bracket ②. Washer ⑫ is mounted on the pin ⑪ with a screw ①, and servesas the PULLEY BRACKET ②.

2. Remounting

1) Apply one drop of oil to the parts of axles ⑨ and ⑩ indicated with arrows.
2) Mount the washer ⑧ and the FRICTION GEAR ASS'Y ⑦ onto the axle ⑨.
3) Mount the special washer ⑥ onto the axle ⑨.
4) Mount the REEL PULLEY ⑤ onto the axle ⑩.
5) Mount the special washer ④ onto the axle ⑩.
6) Set the REEL DRIVE BELT ③.
7) Mount the PULLEY BRACKET ② with the two screws ①.

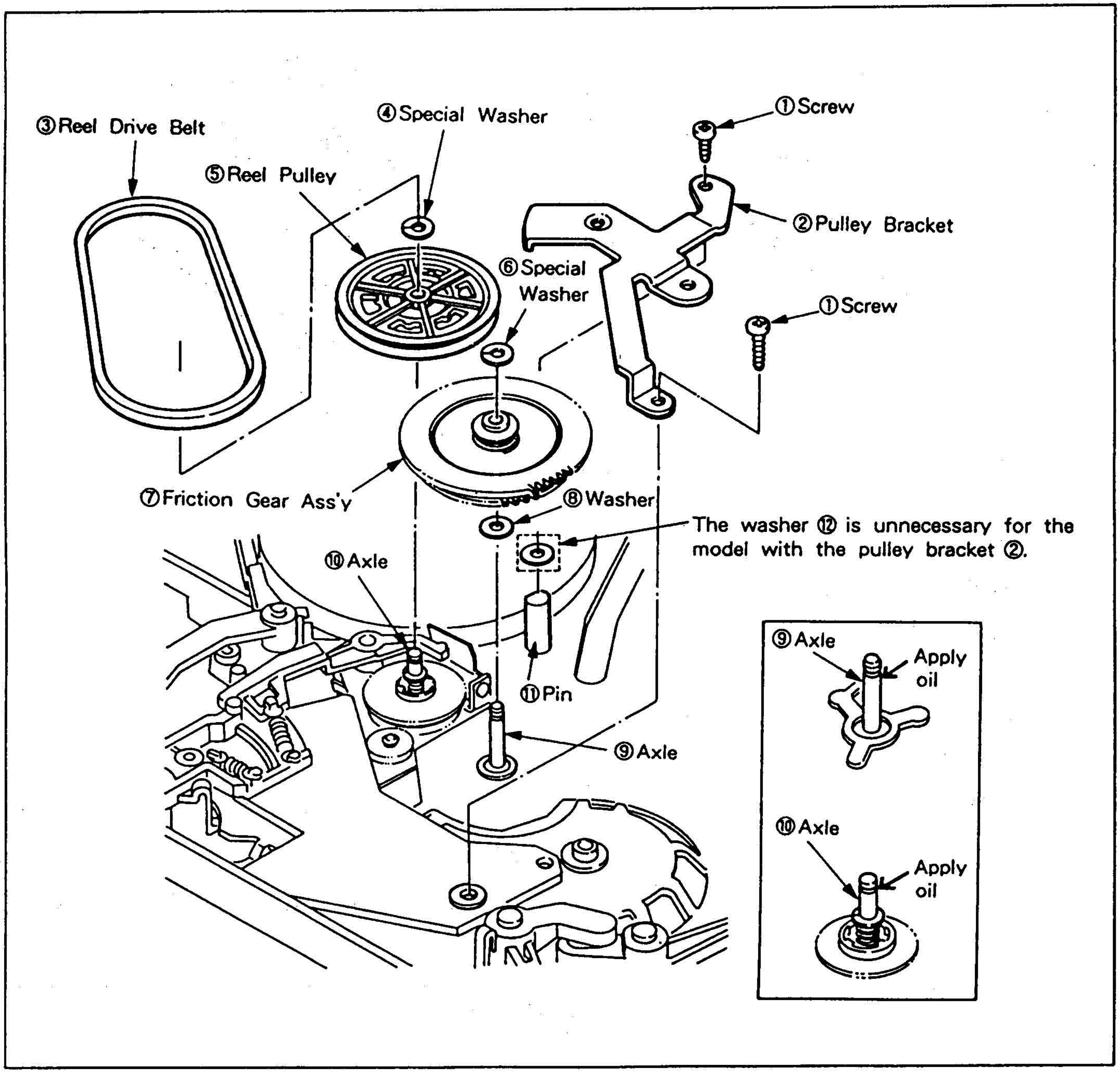

③Reel Drive Belt
⑤Reel Pulley
④Special Washer
①Screw
②Pulley Bracket
⑥Special Washer
①Screw
⑦Friction Gear Ass'y
⑧Washer
The washer ⑫ is unnecessary for the model with the pulley bracket ②.
⑩Axle
⑪Pin
⑨Axle
⑨Axle
Apply oil
⑩Axle
Apply oil

Fig. 7-7-23. Reel Pulley & Friction Gear

(5) COMPL CLUTCH (See Fig. 7-7-24.)

1. Removal

1) Remove the COMPL CASSETTE MECHANISM as instructed in P.101.

2) Remove the PULLEY BRACKET, the REEL DRIVE BELT and the REEL PULLEY as instructed in P.123.

3) Remove the screw ①, then remove the CQMPL MC-4 ②.

4) Remove the two screws ③, then remove the COMPL CLUTCH ④.

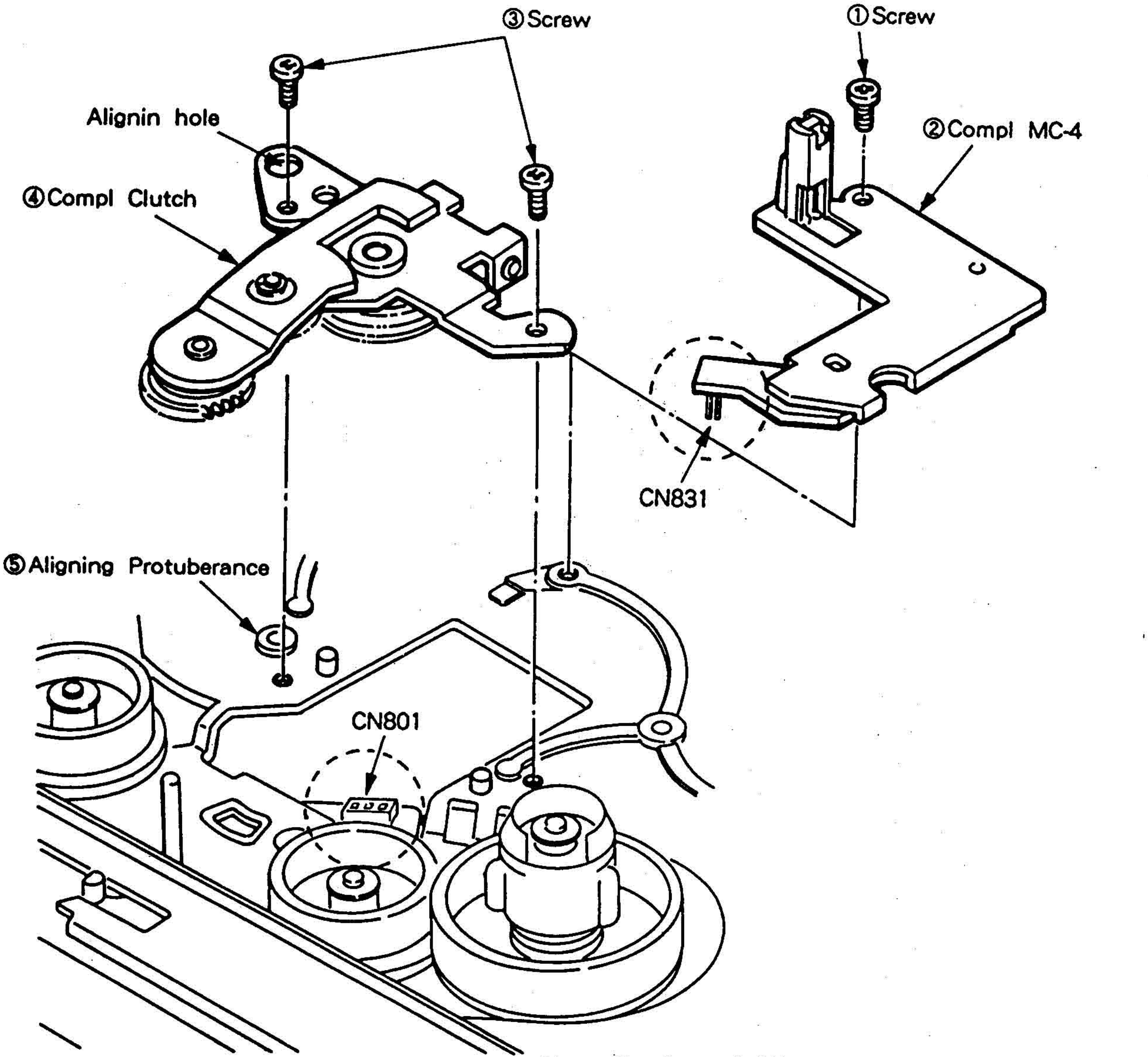
2. Remounting

1) Mount the COMPL CLUTCH ④ with the two screws ③, aligning it with the protuberance ⑤.

2) After inserting the CN831 (COMPL MC-4) into the CN801 (COMPL MC-1), mount the COMPL MC-4 with the screw ①.

3) Mount the REEL PULLEY, the REEL DRIVE BELT and the PULLEY BRACKET as instructed in P.123.

4) Mount the COMPL CASSETTE MECHANISM as instructed in P.101.


③Screw
①Screw
Alignin hole
②Compl MC-4
④Compl Clutch
CN831
⑤Aligning Protuberance
CN801

Note: The form of CN801 and CN 831 differ from the former that.

Fig. 7-7-24. Compl Clutch

(6) CLUTCH CHANGE LEVER AND CLUTCH LEVER ASS'Y (See Fig. 7-7-25.)

1. Removal

1) Remove the CAPSTAN BRAKE ASS'Y as instructed in P.119.
2) Remove the PULLEY BRACKET, the REEL DRIVE BELT and the REEL PULLEY as instructed in P.123.
3) Remove the SPRING COIL ①.
4) Unhook the hook ②, then remove the CLUTCH CHANGE LEVER ③.
5) Unhook the hook ⑤, then remove the CLUTCH LEVER ASS'Y ⑥.

2. Remounting

1) Mount the CLUTCH LEVER ASS'Y ⑥ onto the axle ⑦. Confirm that the hook ⑤ is hooked to the chassis.
2) Mount the CLUTCH CHANGE LEVER ③ onto the axle ⑧. Confirm that the hook ② is hooked to the chassis.
3) Hook the SPRING COIL ① between the hooks ⑨ and ⑩.
4) Mount the PULLEY BRACKET, the REEL DRIVE BELT and the REEL PULLEY as instructed in P.123.
5) Mount the CAPSTAN BRAKE ASS'Y as instructed in P.119.

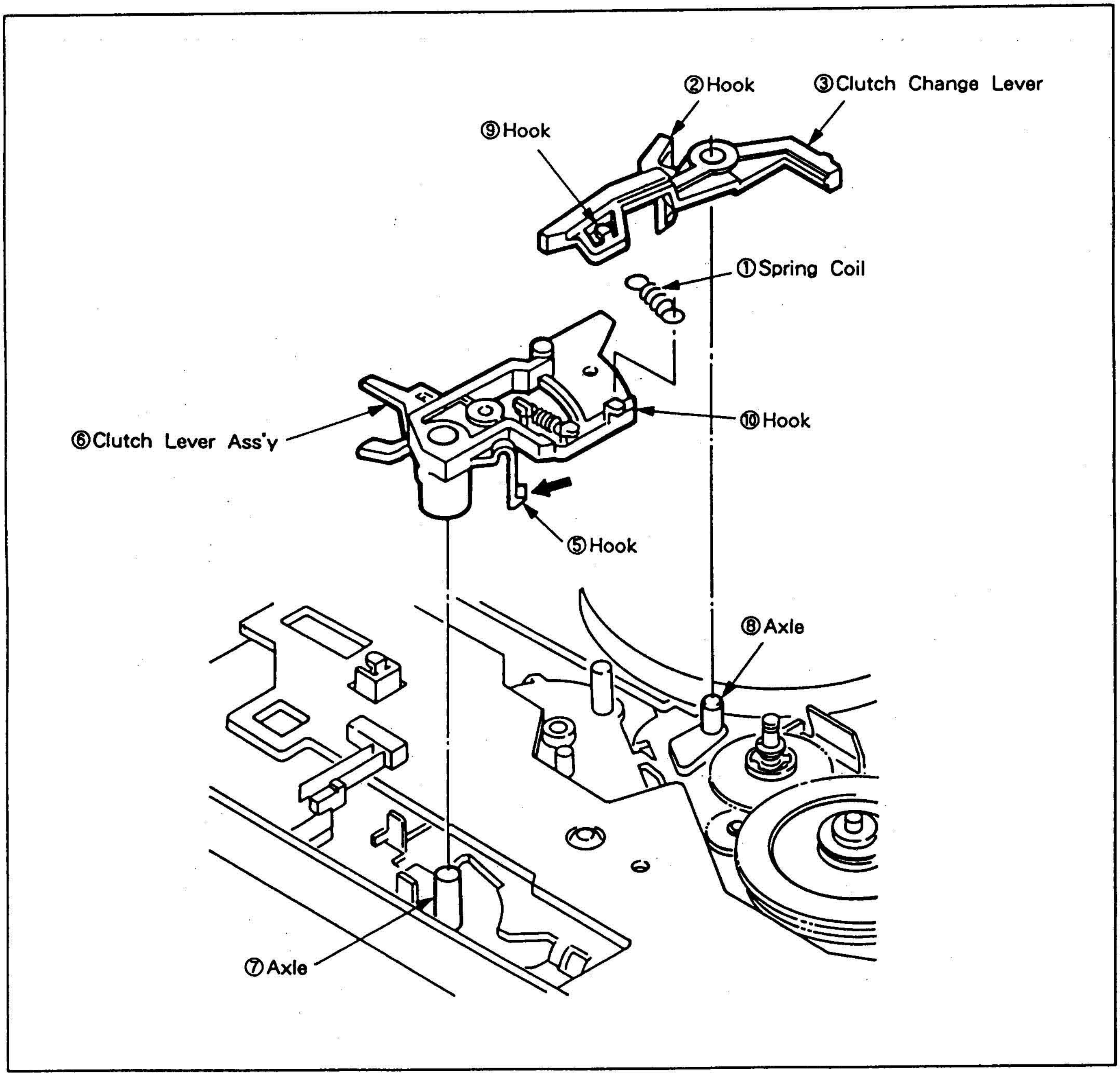

②Hook
③Clutch Change Lever
⑨Hook
①Spring Coil
⑥Clutch Lever Ass'y
⑩Hook
⑤Hook
⑧Axle
⑦Axle

Fig. 7-7-25. Clutch Change Lever & Clutch Lever Ass'y

7-7-9.Capstan Motor (See Fig. 7-7-26.)

1. Removal
1) Remove the CAPSTAN BRAKE ASS'Y as instructed in P.119.
2) Remove the CAPSTAN MOTOR ⑥ connector.
3) Remove the REEL DRIVE BELT ② from the CAPSTAN MOTOR PULLEY ①.
4) Remove the two screws ④ fixing the COMPL CASSETTE MECHANISM TOP BOARD ③, then slide the TOP BOARD ③ backward.
5) Remove the three screws ⑤, then remove the CAPSTAN MOTOR ⑥.

Note: Take care not to scratch or soil the capstan axle.

2. Remounting
1) Mount the CAPSTAN MOTOR ⑥ with the three screws ⑤.
2) Connect the CAPSTAN MOTOR ⑥ connector.
3) Mount the TOP BOARD ③ with the two screws ④.
4) Fit the REEL DRIVE BELT ② around the CAPSTAN MOTOR PULLEY ① and the REEL PULLEY ⑦.
5) Mount the CAPSTAN BRAKE ASS'Y as instructed in P.119.

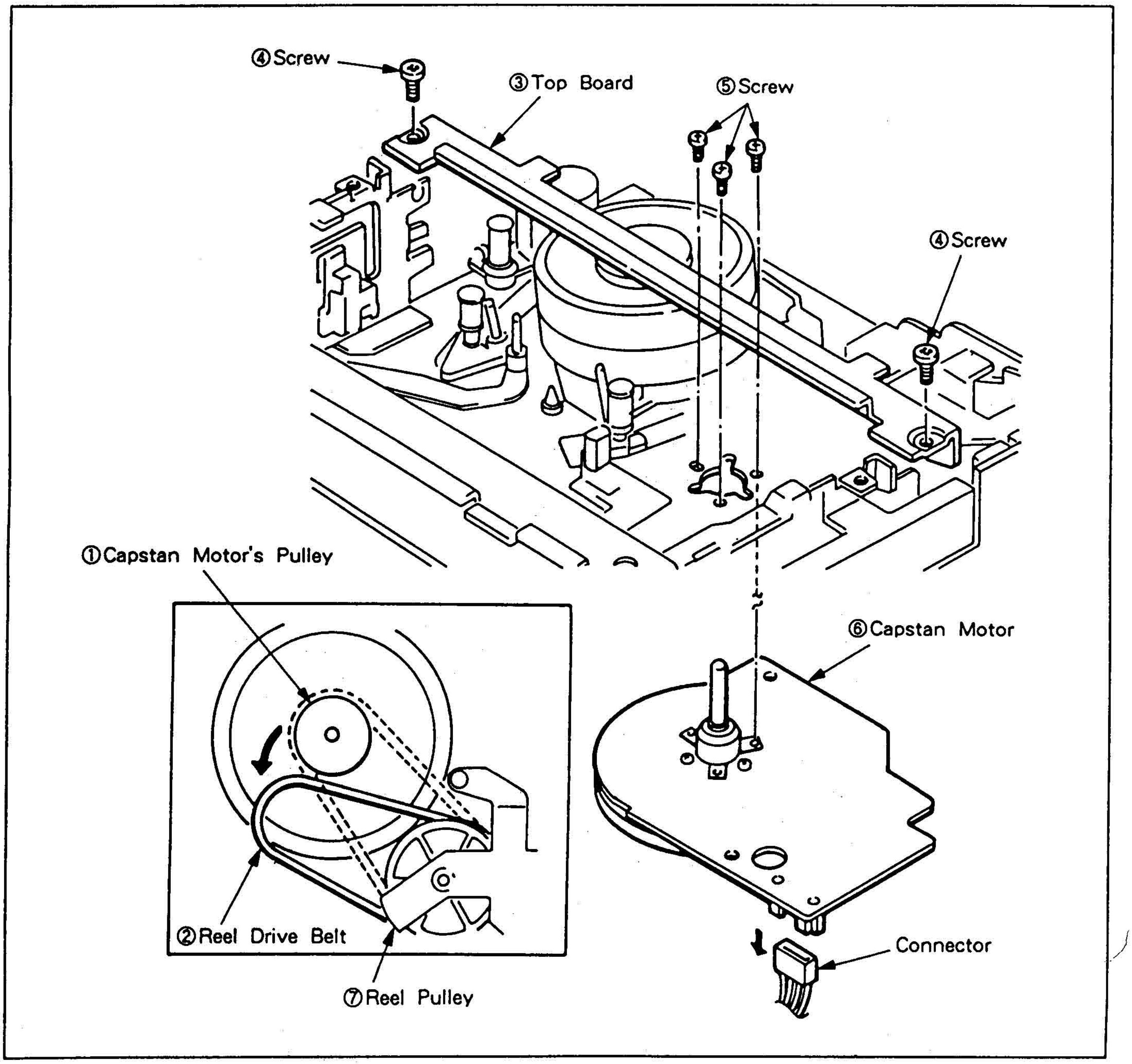

④Screw
③Top Board
⑤Screw
④Screw
①Capstan Motor's Pulley
⑥Capstan Motor
②Reel Drive Belt
Connector
⑦Reel Pulley

Fig. 7-7-26. Capstan Motor

7-7-10. Fixed Guide, FE Head Lever Ass'y

(1) S-SIDE FIXED GUIDE AND FE LEVER ASS'Y (See Fig. 7-7-27.)

1. Removal

1) Remove the special nut ①, then remove the GUIDE PIPE ③ and the special washer ② (lower), in that order.
2) Remove the SPRING COIL ⑤.
3) Remove the FTE HEAD connector.
4) Remove the special washer ⑥, then remove the FE HEAD LEVER ASS'Y ⑦.

2. Remounting

1) After mounting the FE LEVER ASS'Y ⑦ onto the axle ⑧, mount the special washer ⑥.
2) Hook the SPRING COIL ⑤ between the chassis notch ⑨ and the FE LEVER ASS'Y hook ⑩.
3) Mount the special washer ② (lower), the GUIDE pipe ③ and the special nut ① to the axle ⑧, in that order. At that time, do not excessively tighten the special nut ① to avoid idle rotation of the axle rivet. The height of fixing guide on the inlet side is not required.
4) Connect the connector to the FTE HEAD.

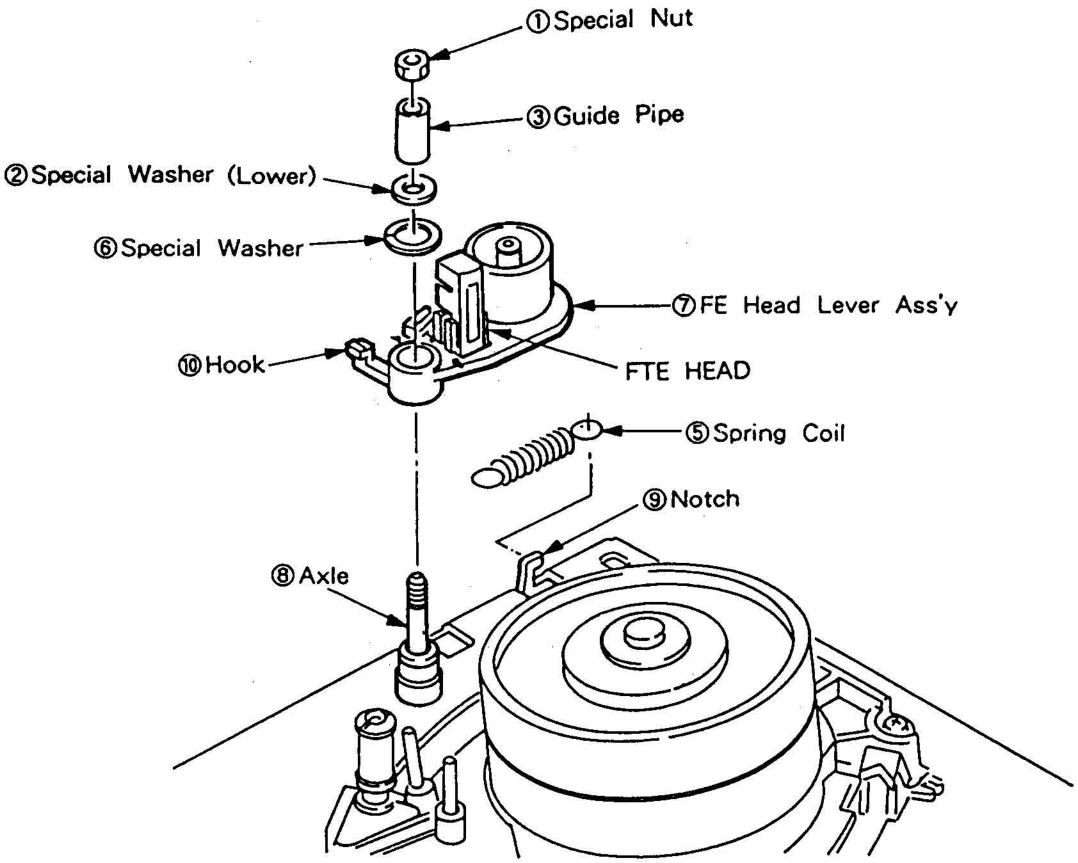

①Special Nut
③Guide Pipe
②Special Washer (Lower)
⑥Special Washer
⑦FE Head Lever Ass'y
⑩Hook
FTE HEAD
⑤Spring Coil
⑨Notch
⑧Axle

Fig. 7-7-27. Fixed Guide(S)& FE Lever Ass'y

(2) IMPEDANCE ROLLER, FTE HEAD
(See Fig. 7-7-28.)

1. Removal
1) Remove the FTE HEAD (full track erase head) ① connector.
2) Remove the special washer ②, then remove the IMPEDANCE ROLLER ③ and the washer ④.
3) Open the hook ⑤ a little and remove the FTE HEAD ①.

Note: Take care not to open the hook too much, otherwise it may be deformed or broken.

2. Remounting
1) Mount the FTE HEAD ① onto the FE HEAD LEVER ASS'Y ⑥. Confirm that the hook ⑤ is hooked to the FTE HEAD ①.
2) Mount the washer ④ and the IMPEDANCE ROLLER ③, in that order, onto the axle ⑦, then mount the special washer ②.
3) Connect the connector to the terminal of the FTE HEAD ①.

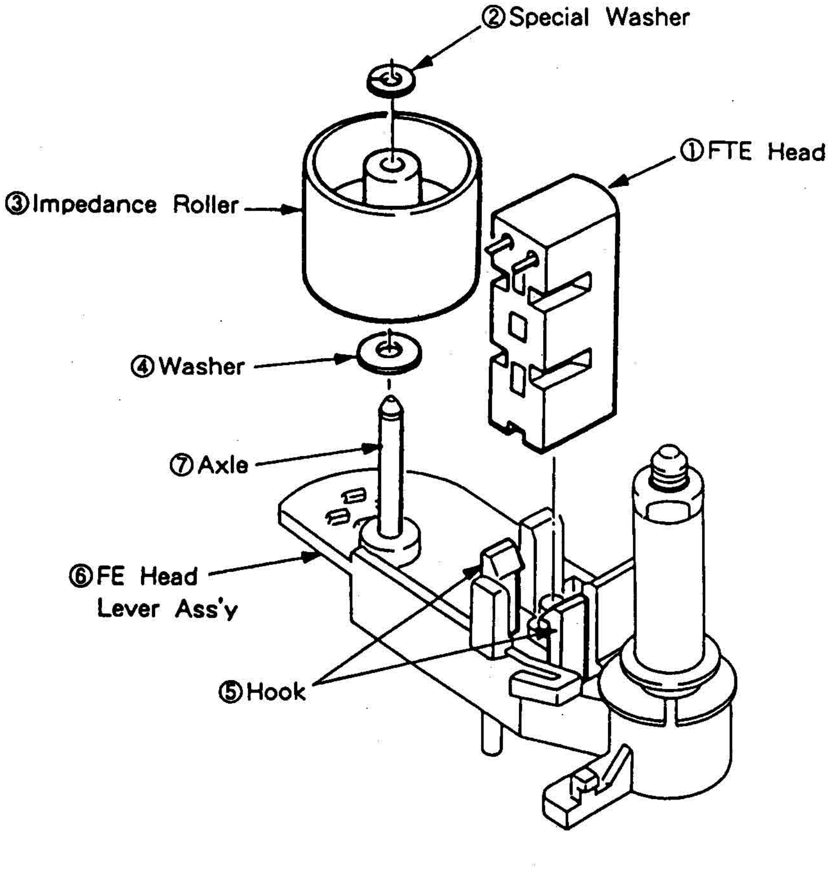

②Special Washer
①FTE Head
③Impedance Roller
④Washer
⑦Axle
⑥FE Head Lever Ass'y
⑤Hook

Fig. 7-7-28. Impedancd Roller & FTE Head

(3) FIXED GUIDE (T) (See Fig. 7-7-29.)

1. Removal

1) Remove the CAP ①.

2) Remove the special nut ②, then remove the special washer ③ (upper), the GUIDE PIPE ④, the special washer ③ (lower) and the Spring Coil ⑤, in that order.

2. Remounting

1) Mount the Spring Coil ⑤, the special washer ③ (lower), the GUIDE PIPE ④, the special washer ③ (upper) and the special nut ②, in that order, to the axle ⑥.

2) Mount the CAP ① onto the axle ⑥.

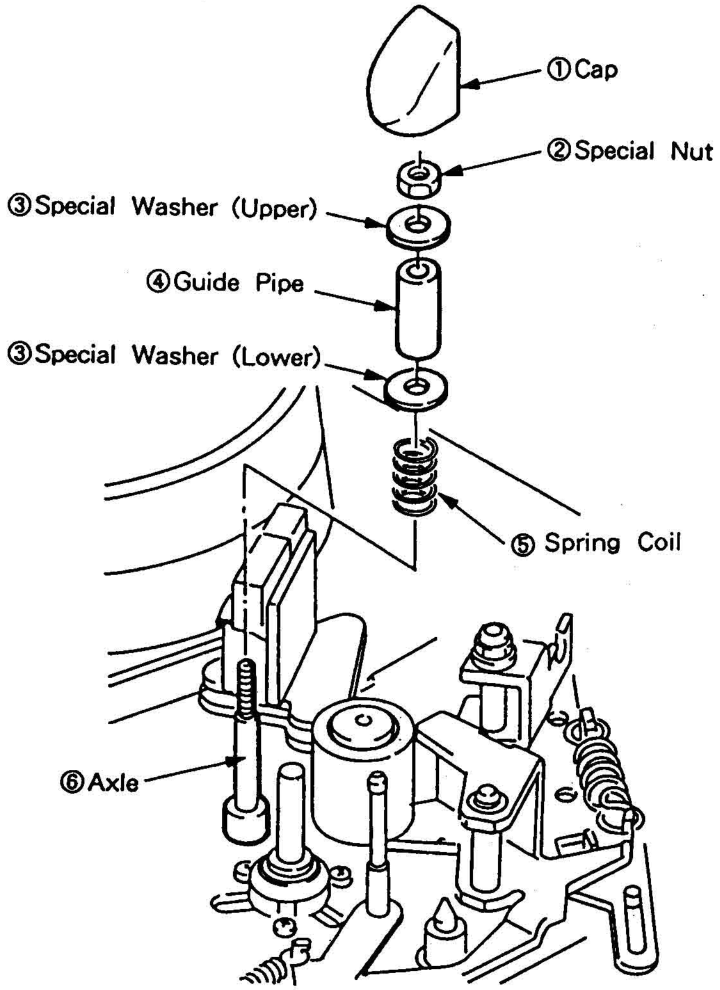

①Cap
②Special Nut
③Special Washer (Upper)
④Guide Pipe
③Special Washer (Lower)
⑤ Spring Coil
⑥Axle

Fig. 7-7-29. Fixed Guide(T)

7-7-11. Drum Section

(1) DRUM MOTOR (ROTOR, STATOR)
(See Fig. 7-7-30.)

1. Removal

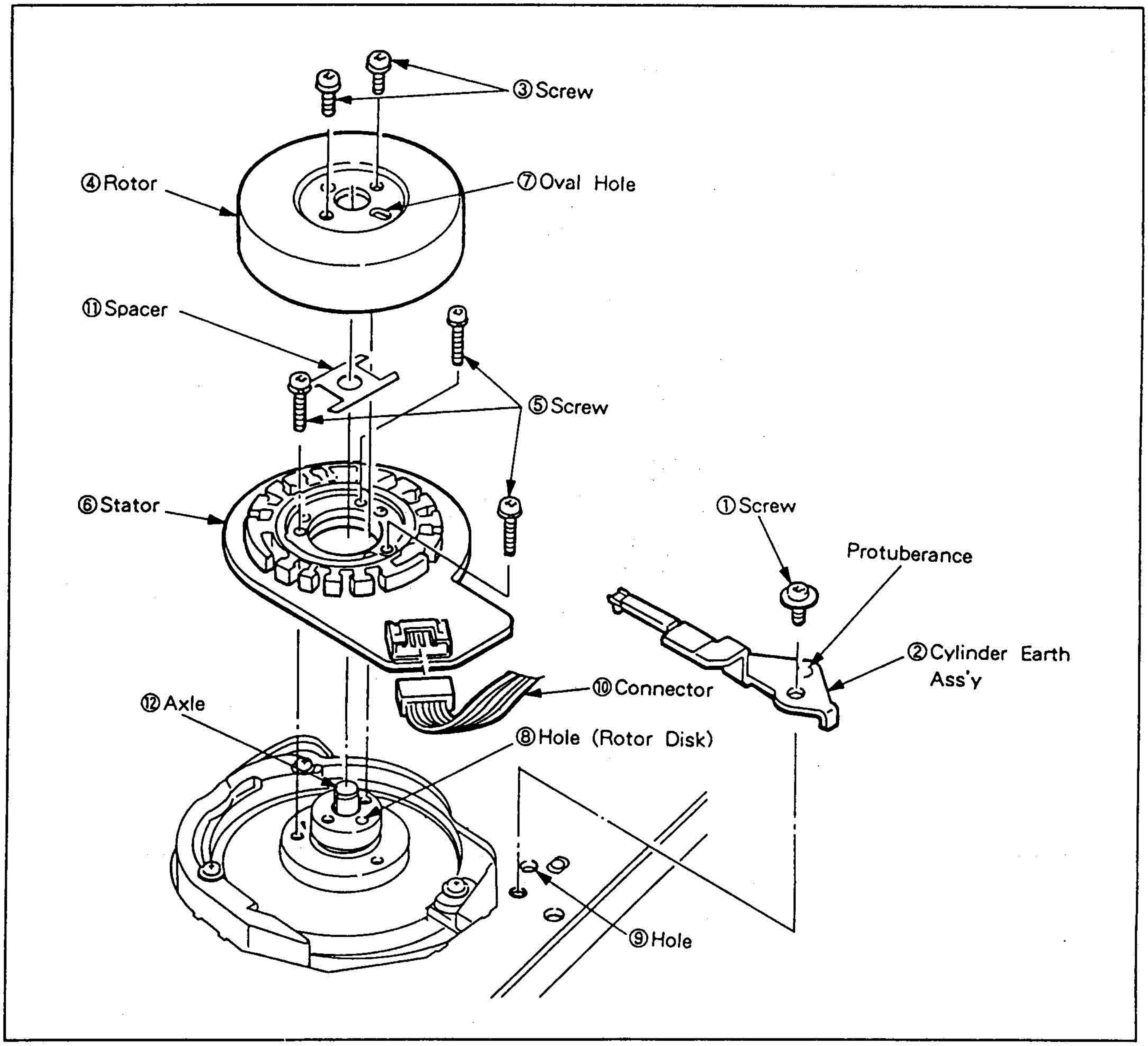
1) Remove the screw ①, then remove the CYLINDER EARTH ASS'Y ②.
2) Remove the two screws ③, then remove the ROTOR ④ and the SPACER.
3) Remove the STATOR board connector.
4) Remove the three screws ⑤, then remove the STATOR ⑥.

2. Remounting

1) Mount the STATOR ⑥ with the three screws ⑤.
2) Mount the SPACER ⑪ onto the AXLE ⑫.
3) While aligning the ROTOR oval hole ⑦ with the ROTOR DISK hole ⑧, mount the ROTOR with the two screws ③.
4) Insert the connector ⑩.
5) While aligning the CYLINDER EARTH ASS'Y ② protuberance with the chassis hole ⑨, mount it with the screw ①.

Note 1: Use a torque driver (VHJ-0014) for mounting the STATOR ⑥ and the ROTOR ④. Set fastening torque to 3 kg-cm.

Note 2: When the drum unit has been replaced, perform a tape path adjustment as instructed in 7-4. and perform a SW PHASE adjustment of the servo circuit.



③Screw
④Rotor
⑦Oval Hole
⑪Spacer
⑤Screw
⑥Stator
①Screw
Protuberance
②Cylinder Earth Ass'y
⑩Connector
⑫Axle
⑧Hole (Rotor Disk)
⑨Hole

Fig. 7-7-30. Drum Motor

(2) DRUM UNIT (See Fig. 7-7-31.)

1. Removal

1) For some models with the board located above the upper drum, remove. the board.

2) Remove the flexible cable ① from the PRE-AMP UNIT (take care not to pull the flexible cable in the upward direction).

3) Remove the LOAD RACK only, as instructed in P.110.

4) Remove the three screws ②, then remove the drum unit ③.

Note: When removing and remounting the drum unit, handle it carefully to protect it from scratches and dirt.

2. Remounting

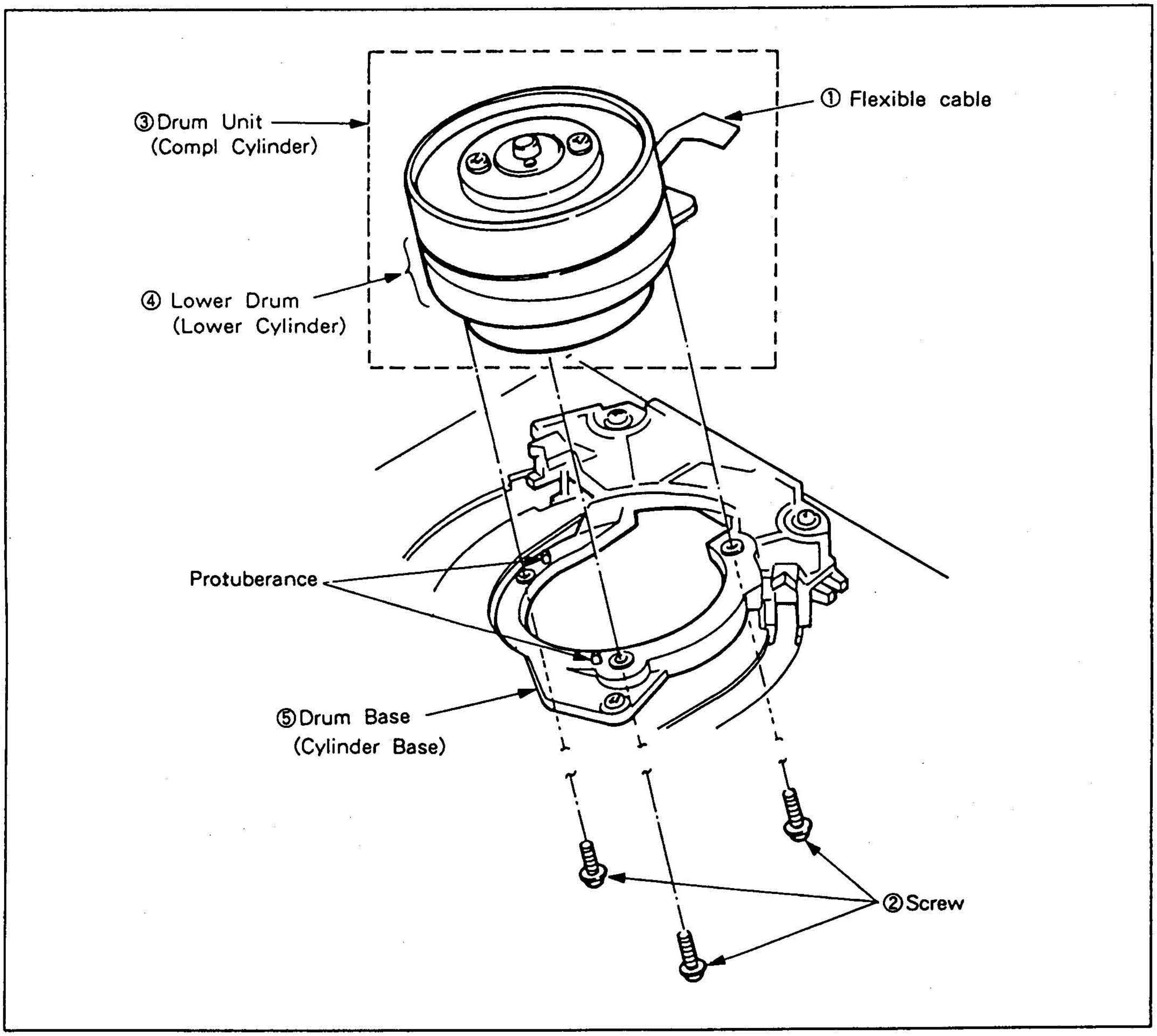
1) While aligning the drum unit ③ to the protuberance, mount it to the drum base (CYLINDER BASE) ⑤ with the three screws ②.

2) Mount the ROAD RACK as instructed in P.110.

3) Insert the flexible cable into the PRE-AMP UNIT.

4) Clean the drum unit.

5) Perform the tape path adjustment as instructed in 7-4. and perform the SW PHASE adjustment of the servo circuit.



① Flexible cable
③Drum Unit
(Compl Cylinder)
④ Lower Drum
(Lower Cylinder)
Protuberance
⑤Drum Base
(Cylinder Base)
②Screw

Fig. 7-7-31. Drum Unit(Compl Cylinder)

(3) UPPER DRUM (Upper Cylinder)

1. Removal

1) Remove the two screws ①. (See Fig. 7-7-32.)
2) In case the RE (ROTARY ERASE) HEAD is attached to the upper drum (UPPER CYLINDER), remove the lead wires soldered from the P.C. board. (See Fig. 7-7-33.)
3) Turn the head removing jig (VHJ-0041) handle ② counterclockwise to lift up the stopper ③. (See Fig. 7-7-34.)
4) Insert the two long screws ④ of the jig into the screw holes ⑥ located on the head chip side of the upper drum (UPPER CYLINDER) ⑤, then mount by turning the handle clockwise.
5) While holding the jig so that the upper drum ⑤ does not rotate, turn the handle ② clockwise to remove the upper drum.
6) Remove the jig from the upper drum.

Note: Handle parts carefully to protect the drum from scratches and dirt, and the video head from damage.

"Disassemble"

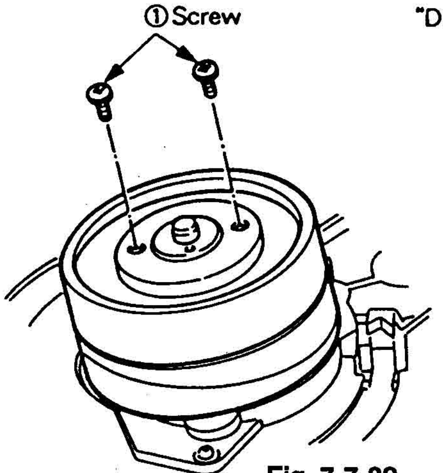


Fig. 7-7-32.

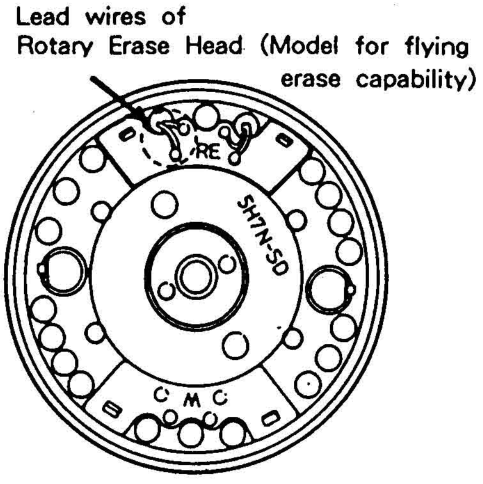

Lead wires of
Rotary Erase Head (Model for flying erase capability)
RE
SH7N-SD
C M C

Fig. 7-7-33.

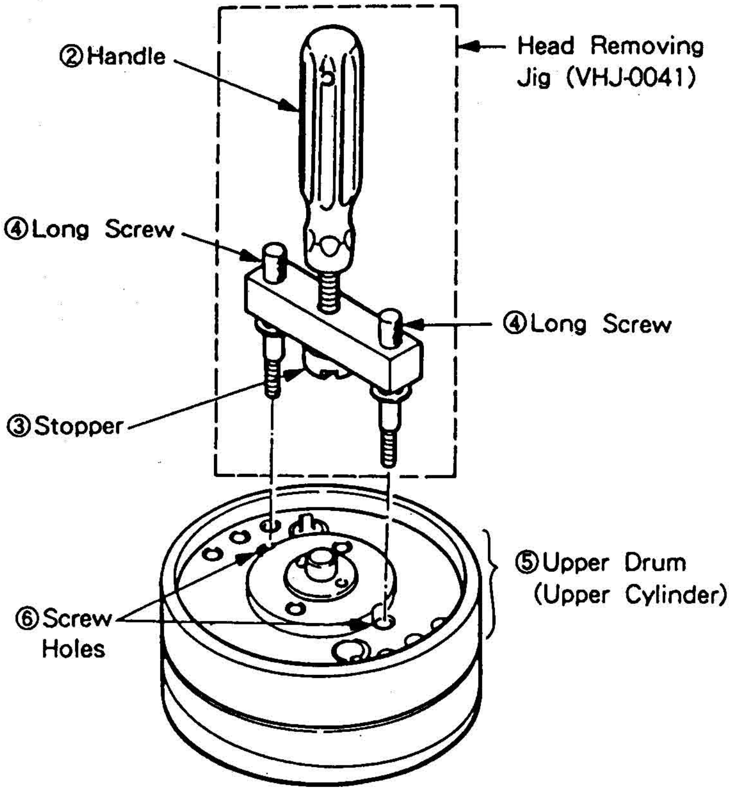

②Handle
Head Removing
Jig (VHJ-0041)
④Long Screw
④Long Screw
③Stopper
⑤Upper Drum
(Upper Cylinder)
⑥Screw
Holes

Fig. 7-7-34.

Upper Drum(Upper Cylinder)

2. Remounting (See Fig. 7-7-35.)

1) Confirm that surfaces where the flywheel and the upper drum (UPPER CYLINDER) are engaged or make contact are free from scratches and dirt.
2) The code name ① of the drum is printed on the video head side of the upper drum ⑤ SP CH-1 (channel A, plus azimuth). The code name ① is set with in the rotary transformer terminal round hole side ② position of lower drum (LOWER CYLINDER), so that the two screw holes ③ of the upper drum are aligned with the two screw holes ④ of the flywheel. (Refer to 3. Recognizing the SP CH-1 Head side.)
3) In case the RE (ROTARY ERASE) HEAD is attached to the upper drum, pass the lead wires through the lead wire hole, (See Fig. 7-7-33.)
4) While keeping the upper drum ⑤ parallel to the lower drum (LOWER CYLINDER) ⑧, insert it completely into the flywheel.
5) Temporarily tighten the two screws ⑦ alternately a little at a time, then tighten them to a torque of 6 kg-cm using a torque driver (VHJ-0014) and a 3 mm bit (VHJ-0045).
6) In case the RE head is attached to the upper drum ⑤, solder the lead wires to the P.C. board. Solder the red lead wire to the R terminal, and the yellow lead wire to the Y terminal.

Note: When the upper drum has been replaced, perform a tape path adjustment as instructed in 7-4. and the SW PHASE adjustment of the servo circuit.

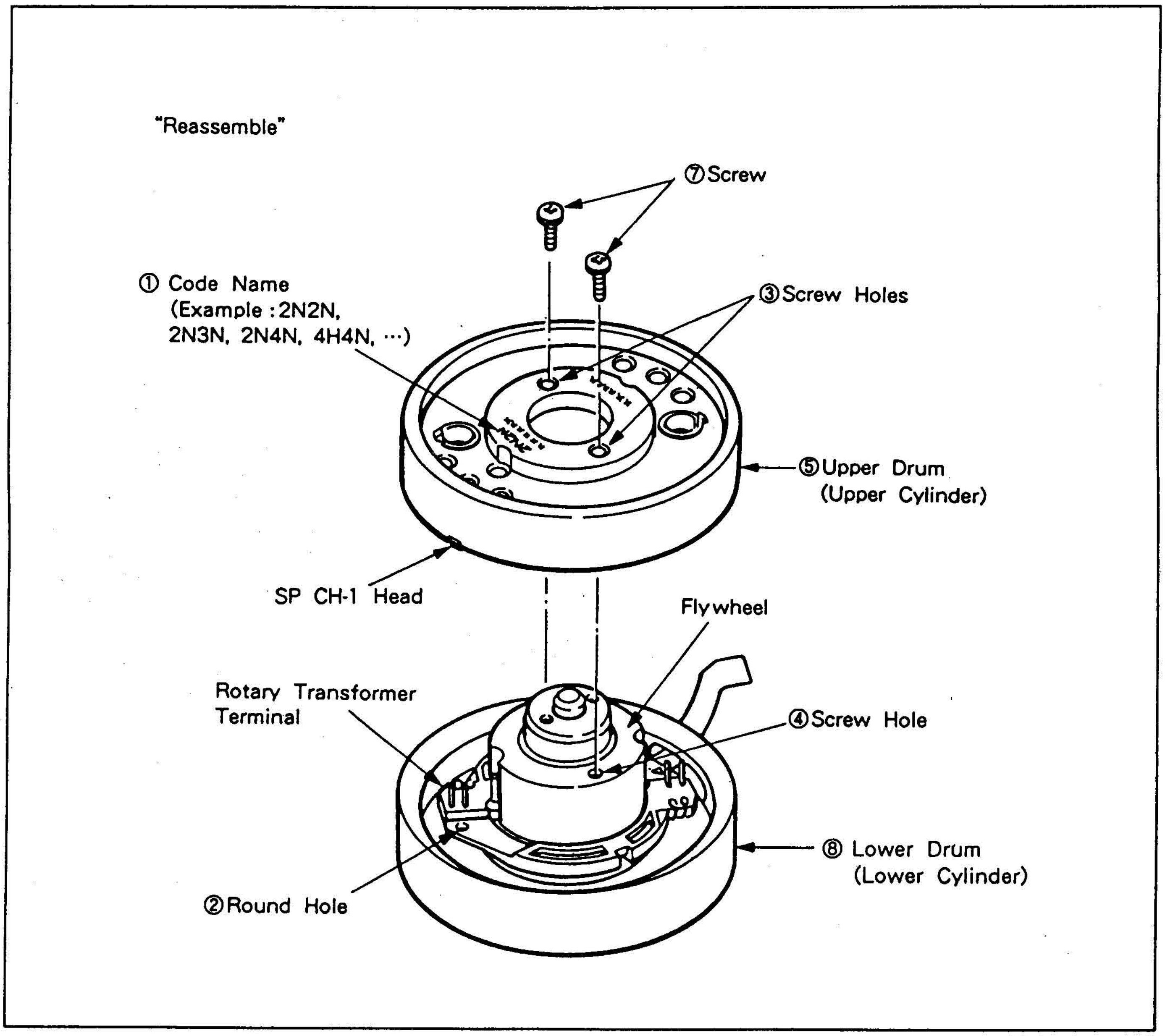

"Reassemble"
⑦Screw
① Code Name
(Example : 2N2N,
2N3N, 2N4N, 4H4N, ···)
③Screw Holes
⑤Upper Drum
(Upper Cylinder)
SP CH-1 Head
Flywheel
Rotary Transformer
Terminal
④Screw Hole
⑧ Lower Drum
(Lower Cylinder)
②Round Hole

Fig. 7-7-35.

3. Recognizing the SP CH-1 Head Side
No playback picture can be obtained if the video head is not wired as a pair with the rotary transformer located inside the lower drum rotating section. Therefore, mounting position should be matched when mounting the upper drum. In the P91 mechanism series, the code name of the drum is printed on the SP CH-1 (CH-A, plus azimuth) side as a mark for mounting the upper drum. (See Fig. 7-7-36.) This code name differs according to the drum type, but its basic form is as follows :

A = Number of head bases
B = "N" for normal audio
"H" for HI-FI audio
C = Number of heads
D = TV system ("N" or "P")
EF = Code for detailed classification. Depending on drum type, it can also be just one character, or a blank space.

Code Name Form
②Ⓝ④Ⓝ-Ⓠ
A B C D E F

Examples of Detailed Classification Codes
V = Head with level difference
D = Compatible with digital units
S = SVHS-compatible

Examples of Code Names
2N4N-Q ...... (NTSC)
2N4P-Q ...... (PAL)

Moreover, there is a round hole with marking purposes on the SP CH-1 (CH-A, plus azimuth) side of the lower drum rotary transformer terminal. As shown in Fig. 7-7-37, there are two types of rotary transformer terminals (the number of pins differs according to the number of heads).

Note: When ordering parts such as drums (CYLINDERS), do not use the code names; always refer to the parts list and order with the specified part numbers.

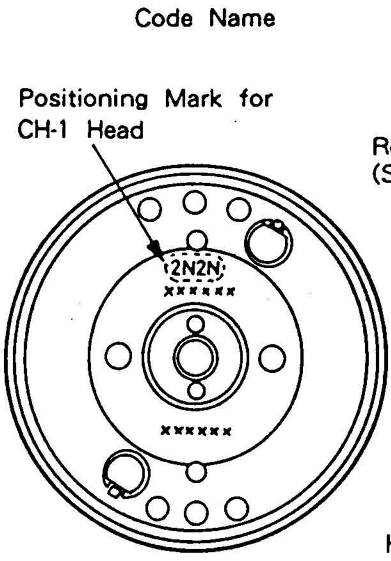

Code Name
Positioning Mark for CH-1 Head
2N2N
xxxxxx
xxxxxx

Fig. 7-7-36. Upper Drum

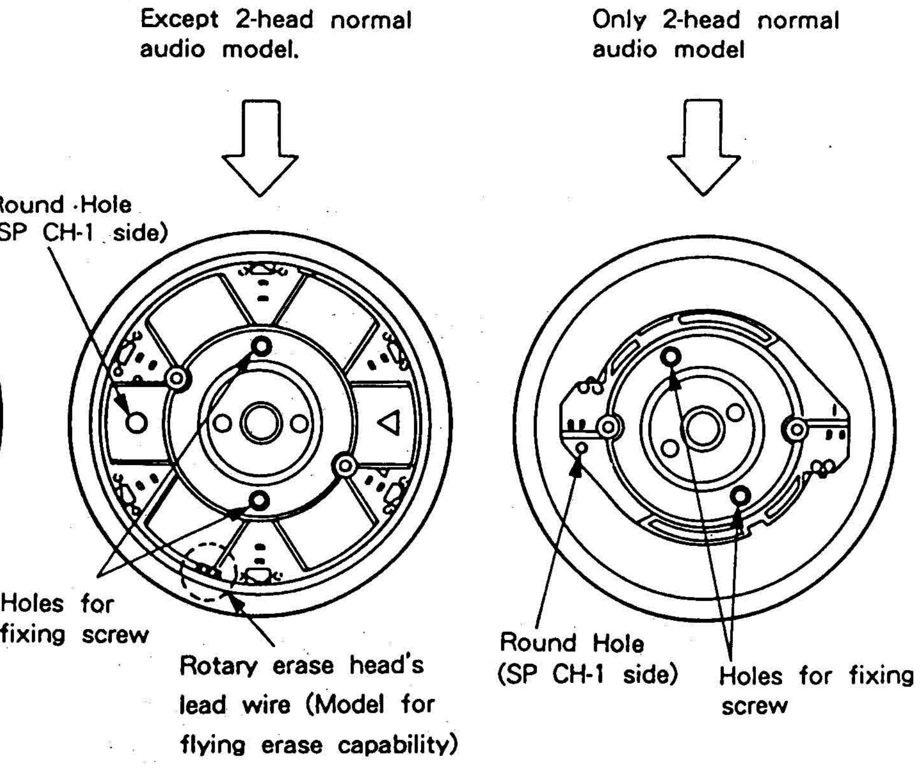
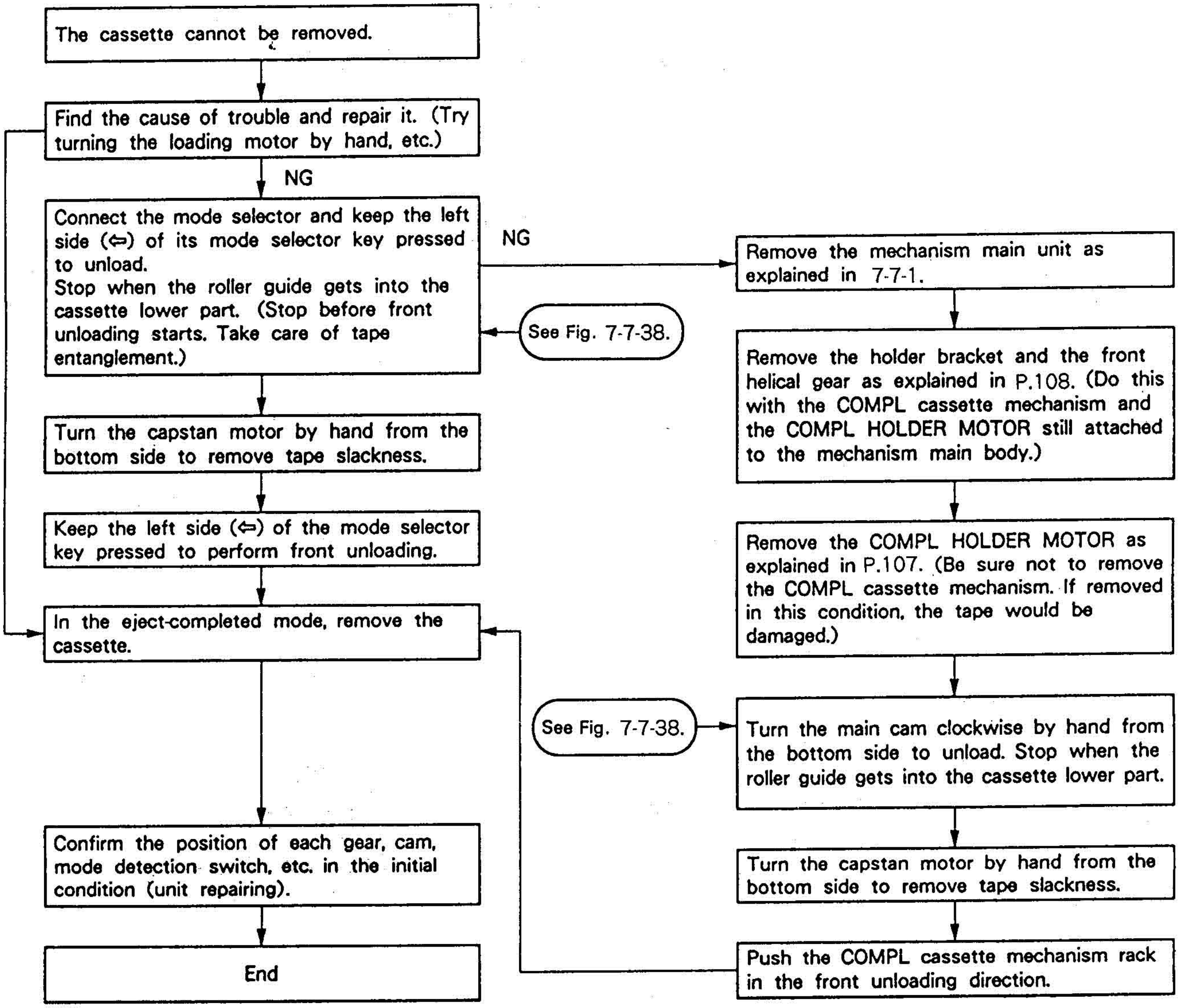

Except 2-head normal audio model.
Only 2-head normal audio model
Round Hole (SP CH-1 side)
Holes for fixing screw
Rotary erase head's lead wire (Model for flying erase capability)
Round Hole (SP CH-1 side)
Holes for fixing screw

Fig. 7-7-37. Lower Drum

7-7-12. How To Proceed When The Cassette Cannot Be Removed



The cassette cannot be removed.

Find the cause of trouble and repair it. (Try turning the loading motor by hand, etc.)

NG

Connect the mode selector and keep the left side (⇦) of its mode selector key pressed to unload.
Stop when the roller guide gets into the cassette lower part. (Stop before front unloading starts. Take care of tape entanglement.)

See Fig. 7-7-38.

NG

Remove the mechanism main unit as explained in 7-7-1.

Remove the holder bracket and the front helical gear as explained in P.108. (Do this with the COMPL cassette mechanism and the COMPL HOLDER MOTOR still attached to the mechanism main body.)

Remove the COMPL HOLDER MOTOR as explained in P.107. (Be sure not to remove the COMPL cassette mechanism. If removed in this condition, the tape would be damaged.)

See Fig. 7-7-38.

Turn the main cam clockwise by hand from the bottom side to unload. Stop when the roller guide gets into the cassette lower part.

Turn the capstan motor by hand from the bottom side to remove tape slackness.

Push the COMPL cassette mechanism rack in the front unloading direction.

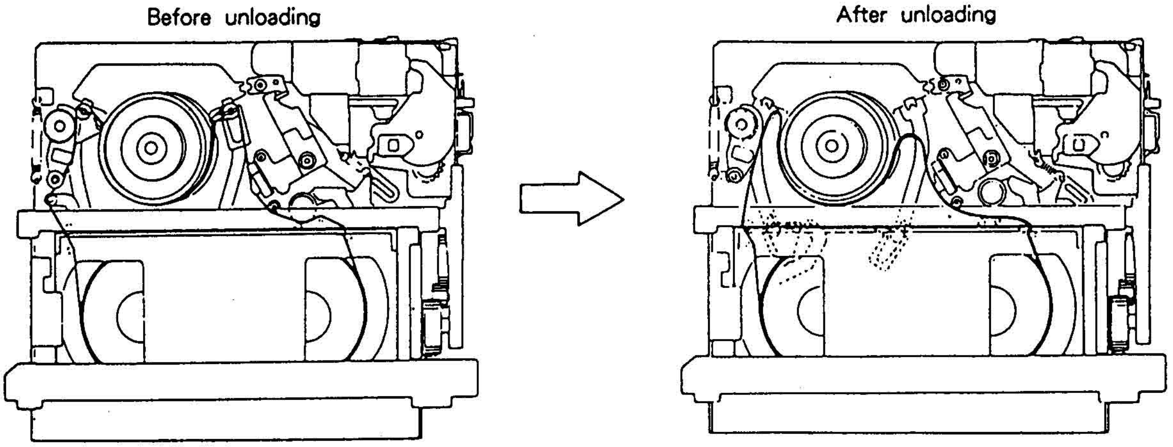
Turn the capstan motor by hand from the bottom side to remove tape slackness.

Keep the left side (⇦) of the mode selector key pressed to perform front unloading.

In the eject-completed mode, remove the cassette.

Confirm the position of each gear, cam, mode detection switch, etc. in the initial condition (unit repairing).

End



Perform unloading using the mode selector.

First rotate the capstan motor by hand from the bottom to take-up the tape slack, and perform front-unloading using the mode selector.

Fig. 7-7-38.

SECTION 8
ELECTRICAL ADJUSTMENTS

PREPARATION

EQUIPMENT

- Color TV monitor
- NTSC Color-bar generator (with RF and LINE OUTPUT)
- Audio signal generator
- Oscilloscope (dual trace, frequency response : 30MHz or more) (Use a 10 : 1 probe unless specified otherwise.)
- Vectorscope
- Frequency counter
- AC voltmeter
- In/Output probes

In making the adjustment, an alignment tape for VHS (NTSC). If a model is specified, be sure to use a tape of the model.

【Alignment Tape (MH-1)】 (H-7099-046-H) (NTSC)

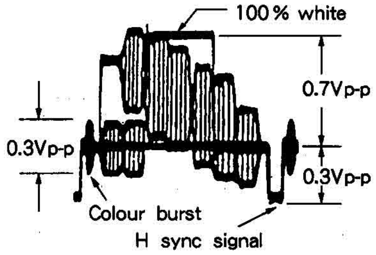
	Mode	**Time**	**Video signal**	**Audio signal**
1	SP	10minutes	Stair-step	6kHz
2	SP	5minutes	–	3kHz
3	SP	10minutes	Color bar	1kHz
4	SP	3minutes	RF sweep	–

【Alignment Tape (HiFi 400Hz)】 (H-7099-153-H) (NTSC)

SET-UP

Because the RF input signal is used for circuit adjustments, connect the color-bar generator to the VIDEO IN terminal of the VCR. It is important that the video output signal satisfies the items shown in Fig. 2-1. Connect the oscilloscope to the VIDEO OUTPUT terminal of the TB-1 BOARD and terminate with a 75 Ω load, and then check the video output signal.

- The amplitude of the video signal should be approximately 0.3Vp-p.
- The amplitude of the video signal should be approximately 0.7Vp-p.
- While observing the oscilloscope or TV screen, make fine-tuning adjustments so that the color burst amplitude is approximately 0.3Vp-p.
- Check to be sure that there is no spike noise in the sync part of the horizontal sync signal.



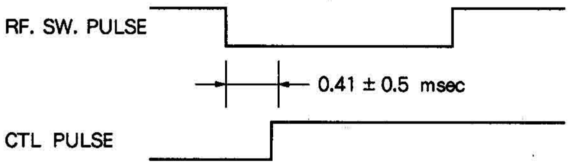
8-1. SERVO CIRCUIT ADJUSTMENTS

NORMAL TRACKING Adjustment

Mode	Playback 2H mode
Signal	Alignment tape NTSC HiFi 400Hz
Measurement point	TP351 or J3517 (CTL PULSE) TP182 (RF. SW. PULSE) PRE AMP unit
Measurement equipment	Oscilloscope
Adjustment element	VR353
Specified value	0.41 ± 0.5msec

Adjustment Method

1) Make sure that the normal tracking VR is at the center click.
2) Trigger upon the fall of RF. SW. PULSE (PRE AMP TP182), and adjust VR353 so that the rise of CTL PULSE may be retarded by 0.41 ± 0.5 msec. as compared with the fall of RF. SW. PULSE.



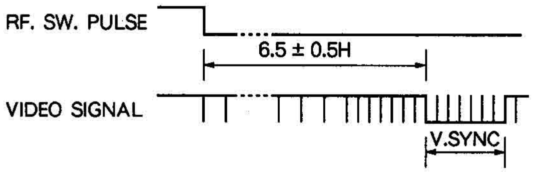
Note: 1) This adjustment should be performed before the adjustment of X-value of the mechanism.

SW PHASE (CH-1) Adjustment

Mode	Playback 2H mode
Signal	Alignment tape NTSC HiFi 400Hz
Measurement point	Video output terminal TP182 (RF. SW. PULSE) PRE AMP unit
Measurement equipment	Oscilloscope
Adjustment element	VR354
Specified value	6.5 ± 0.5H

Adjustment Method

1) Make sure that the normal tracking VR is at the center click.
2) Trigger upon the fall of RF. SW. PULSE (PRE AMP TP182), and adjust so that the front edge of the vertical sync signal is retarded by 6.5 ± 0.5H as compared with the fall of RF. SW. PULSE.



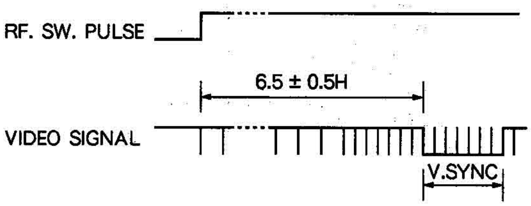
Note: 1) Check tapes should be NTSC HiFi 400Hz or the equal ones.

SWITCHING POSITION (CH-2) Check

Mode	Playback 2H mode
Signal	Alignment tape NTSC HiFi 400Hz
Measurement point	Video output terminal TP182 (RF. SW. PULSE) PRE AMP unit
Measurement equipment	Oscilloscope
Specified value	6.5 ± 0.5H

Adjustment Method

1) Make sure that the normal tracking VR is at the center click.
2) Trigger upon the fall of RF. SW. PULSE (PRE AMP TP182), and make sure that the front edge of the vertical sync signal is retarded by 6.5 ± 0.5H as compared with the fall of RF. SW. PULSE.



Note: 1) Make sure that the phase difference between CH-1 and CH-2 switching positions is within 0.5H.
2) Check tapes should be NTSC HiFi 400Hz or the equal ones.

STILL V-LOCK Adjustment

Mode	Self-recording, Playback 2H mode
Signal	monoscope pattern
Measurement point	Monitor screen
Measurement equipment	Monitor
Adjustment element	VR724 (TM-2 BOARD)

Adjustment Method

1) Adjust STILL ADJUST (VR724) so that center of the monitor screen may be stabilized at STILL.

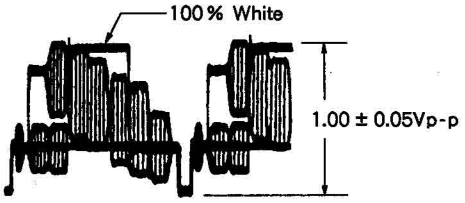
8-2. VIDEO CIRCUIT ADJUSTMENTS

AGC LEVEL Adjustment

Mode	E-E
Signal	NTSC Color bar
Measurement point	VIDEO OUT (TP101)
Measurement equipment	Oscilloscope
Adjustment element	VR102
Specified value	1.00 ± 0.05Vp-p

Adjustment Method

1) Adjust VR102 so that the level is 1.00 ± 0.05Vp-p.

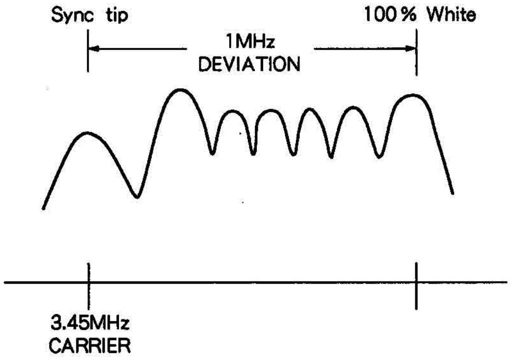


DEVIATION, CARRIER SET Adjustment

Mode	E-E
Signal	NTSC Color bar
Measurement point	TP103
Measurement equipment	Spectrum analyzer
Adjustment element	VR103 (carrier) VR104 (deviation)
Specified value	3.45 ± 0.05MHz (carrier frequency) 1.00 ± 0.05MHz (deviation)

Adjustment Method

1) Adjust the carrier frequency to 3.45 ± 0.05MHz and the deviation to 1.00 ± 0.05MHz in color bar input E-E state.



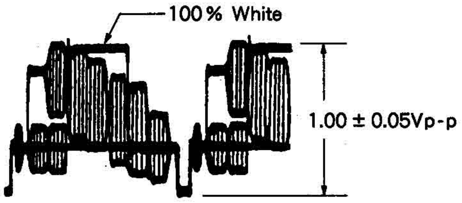
Note: The 100% white frequency must be within 4.45 ± 0.05MHz, in this case.

PB LEVEL Adjustment

Mode	Playback 2H mode
Signal	Alignment tape MH-1
Measurement point	VIDEO OUT (TP101)
Measurement equipment	Oscilloscope
Adjustment element	VR101
Specified value	1.00 ± 0.05V_{P-P}

Adjustment Method

1) Terminate VIDEO OUTPUT terminal with a 75 ohms.
2) Adjust VR101 so that the level is 1.00 ± 0.05Vp-p.

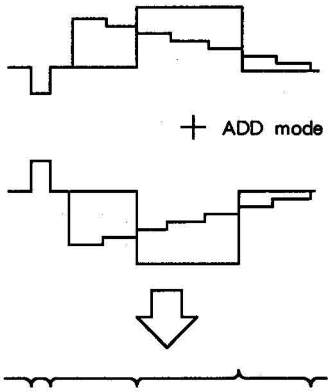


DOC LEVEL (N. C.) Adjustment

Mode	Playback 2H mode
Signal	ⓐ Alignment tape MH-1 (or self-recording playback) ⓑ Alignment tape NX-S704M
Measurement point	ⓐ IC101 ⑨pin, ⑩pin ⓑ VIDEO OUT (TP101)
Measurement equipment	Oscilloscope
Adjustment element	VR105

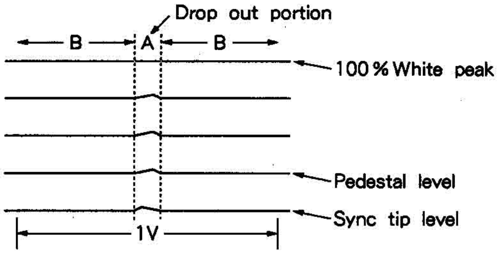
Adjustment Method ⓐ

1) Holding IC101⑨pin in CH1, IC101⑩pin in CH2, one of the channels is inverted in the same range, using in the add mode.
2) Adjust VR105 so that the waveform becomes minimum.



Adjustment Method ⓑ

1) Adjust VR105 so that the white peak level of the drop-out is nearly equal to that of the non-drop-out.

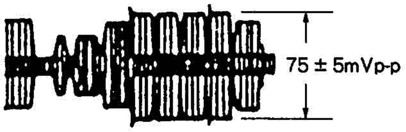


REC C CURRENT Adjustment

Mode	Recording 2H mode
Signal	NTSC Color bar
Measurement point	TP181 (Ground at the shield case) PRE AMP unit
Measurement equipment	Oscilloscope
Adjustment element	VR182 (VP-1 BOARD)
Specified value	75 ± 5mVp-p

Adjustment Method

1) Connect TP102 and TP103 with jumper wire.
2) Adjust VR182 so that the level is 75 ± 5mVp-p.

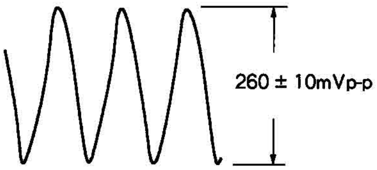


REC Y CURRENT Adjustment

Mode	Recording 2H mode
Signal	No-signal
Measurement point	TP181 (Ground at the shield case) PRE AMP unit
Measurement equipment	Oscilloscope
Adjustment element	VR181 (VP-1 BOARD)
Specified value	260 ± 10mVp-p

Adjustment Method

1) Adjust VR181 so that the level is 260 ± 10mVp-p.

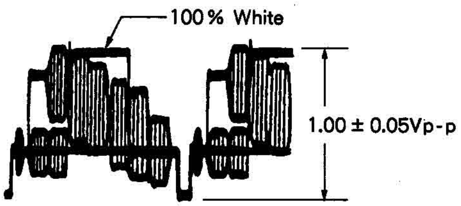


RECORD AND PLAYBACK LEVEL Checking

Mode	Self-recording, Playback 2H mode
Signal	NTSC color bar
Measurement point	VIDEO OUT (TP101)
Measurement equipment	Oscilloscope

Adjustment Method

1) Terminate the video output terminal at 75ohms, and input color bar signal including 100% white to record and playback. Make sure that the output level is 1.00 ± 0.05Vp-p.



8-3. AUDIO CIRCUIT ADJUSTMENTS

BIAS LEVEL Adjustment

Mode	Recording 2H mode
Signal	No-signal
Measurement point	TP201 (HOT) TP202 (COLD)
Measurement equipment	AC voltmeter Frequency counter
Adjustment element	VR201
Specified value	22mV 71 ± 5kHz

Adjustment Method

1) Load a cassette tape, and set the voltage between TP202 (COLD) and TP201 (HOT) to 22mV (220 μ A).
2) Make sure that the oscillation frequency is 71kHz ± 5kHz.

NORMAL PB LEVEL Adjustment

Mode	Playback 2H mode
Signal	Alignment tape MH-1(1kHz section)
Measurement point	Audio output terminal
Measurement equipment	AC voltmeter
Adjustment element	VR202
Specified value	− 7 ± 1dBm

Adjustment Method

1) Play back the Alignment tape (MH-1), and adjust so the output voltage to − 7 ± 1dBm.

RECORD CURRENT Checking

Mode	Recording
Signal	1kHz
Measurement point	TP201 (HOT) TP202 (COLD)
Measurement equipment	AC voltmeter
Specified value	2.7 ± 0.5mV

Adjustment Method

1) Input the reference input to be in record state.
2) Short-circuit between Q2001 base and emitter to stop the bias oscillation. (Or, pass the output signal between TP202 (COLD) and TP201 (HOT) through 1kHz B. P. F. to remove the bias.)
3) Make sure that the record current is 2.7 ± 0.5mV.

PLAYBACK OUTPUT (12H MODE) Adjustment

Mode	Playback 12H mode (AUDIO ON)
Signal	Alignment tape MH-1 (1kHz section)
Measurement point	Audio output terminal
Measurement equipment	AC voltmeter
Adjustment element	VR204
Specified value	− 7 ± 1dBm

Adjustment Method

1) Play back the Alignment tape (MH-1), and adjust so the output voltage to − 7 ± 1dBm.

PLAYBACK OUTPUT (24H MODE) Adjustment

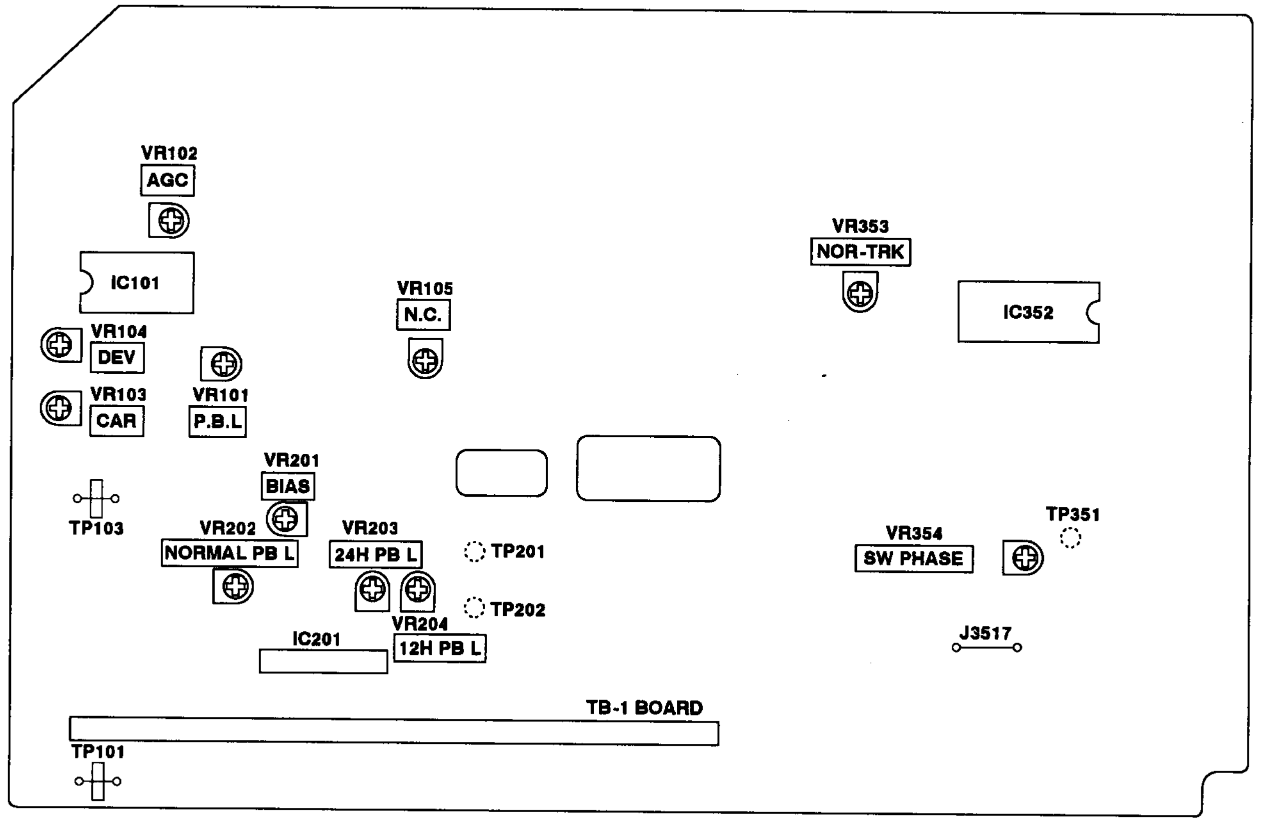
Mode	Playback 24H mode
Signal	Alignment tape MH-1 (1kHz section)
Measurement point	Audio output terminal
Measurement equipment	AC voltmeter
Adjustment element	VR203

Adjustment Method

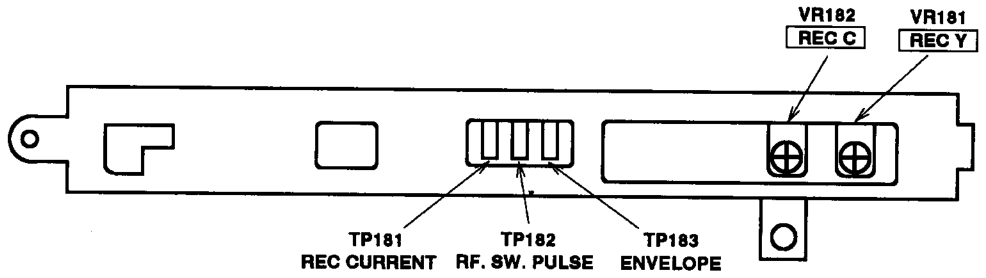
1) Play back the Alignment tape (MH-1), and adjust so the output voltage to − 7 ± 1dBm.

8-4. PARTS ARRANGEMENT DIAGRAMS FOR ADJUSTMENT

CP-1 BOARD (COMPONENT SIDE)

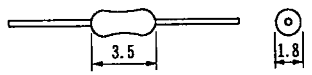

VR102
AGC
IC101
VR104
DEV
VR103
CAR
VR101
P.B.L
VR105
N.C.
VR201
BIAS
TP103
VR202
NORMAL PB L
VR203
24H PB L
TP201
TP202
VR204
12H PB L
IC201
TB-1 BOARD
TP101
VR353
NOR-TRK
IC352
VR354
SW PHASE
TP351
J3517

PRE-AMP Unit (VP-1 BOARD)


VR182
REC C
VR181
REC Y
TP181
REC CURRENT
TP182
RF. SW. PULSE
TP183
ENVELOPE

Description

	5%	¼W	A
CARBON RESISTOR	5%	¼W	



Value	Part. No.	Value	Part. No.	Value	Part. No.	Value	Part. No.	Value	Part. No.	Value	Part. No.
0.22Ω		11Ω	1-247-784-00	200Ω	1-247-814-11	3.6kΩ	1-247-844-11	62kΩ	1-247-874-11	1.2MΩ	
0.27Ω		12Ω	1-249-394-11	220Ω	1-249-409-11	3.9kΩ	1-249-424-11	68kΩ	1-249-439-11	1.5MΩ	
0.33Ω		13Ω	1-247-786-11	240Ω	1-247-816-11	4.3kΩ	1-247-846-11	75kΩ	1-247-876-11	1.8MΩ	
0.39Ω		15Ω	1-249-395-11	270Ω	1-249-410-11	4.7kΩ	1-249-425-11	82kΩ	1-249-440-11	2.0MΩ	
0.47Ω	1-249-377-11	16Ω	1-247-788-00	300Ω	1-247-818-11	5.1kΩ	1-247-848-11	91kΩ	1-247-878-00	2.2MΩ	1-259-880-11
0.56Ω	1-249-378-11	18Ω	1-249-396-11	330Ω	1-249-411-11	5.6kΩ	1-249-426-11	100kΩ	1-249-441-11	2.7MΩ	
0.68Ω	1-249-379-11	20Ω	1-247-790-11	360Ω	1-247-820-11	6.2kΩ	1-247-850-11	110kΩ	1-247-880-11	3.3MΩ	
0.82Ω	1-249-380-11	22Ω	1-249-397-11	390Ω	1-249-412-11	6.8kΩ	1-249-427-11	120kΩ	1-247-881-00	3.9MΩ	
1.0Ω	1-249-381-11	24Ω	1-247-792-11	430Ω	1-247-822-11	7.5kΩ	1-247-852-11	130kΩ	1-247-882-11	4.7MΩ	
1.2Ω	1-249-382-11	27Ω	1-249-398-11	470Ω	1-249-413-11	8.2kΩ	1-249-428-11	150kΩ	1-247-883-00	5.6MΩ	
1.5Ω	1-249-383-11	30Ω	1-247-794-11	510Ω	1-249-442-11	9.1kΩ	1-247-854-11	160Ω	1-247-884-11	6.8MΩ	
1.6Ω		33Ω	1-249-399-11	560Ω	1-249-414-11	10kΩ	1-249-429-11	180Ω	1-247-885-00	8.2MΩ	
1.8Ω	1-249-384-11	36Ω	1-247-796-11	620Ω	1-247-826-00	11kΩ	1-247-856-00	200kΩ	1-247-886-11	10MΩ	
2.2Ω	1-249-385-11	39Ω	1-249-400-11	680Ω	1-249-415-11	12kΩ	1-249-430-11	220kΩ	1-247-887-00	12MΩ	
2.4Ω	1-247-768-00	43Ω	1-247-798-11	750Ω	1-247-828-11	13kΩ	1-247-858-11	240kΩ	1-247-888-11	15MΩ	
2.7Ω	1-249-386-11	47Ω	1-249-401-11	820Ω	1-249-416-11	15kΩ	1-249-431-11	270kΩ	1-247-889-00	18MΩ	
3.0Ω	1-247-770-00	51Ω	1-247-800-11	910Ω	1-247-830-11	16kΩ	1-247-860-11	300kΩ	1-247-890-11	22MΩ	
3.3Ω	1-249-387-11	56Ω	1-249-402-11	1.0kΩ	1-249-417-11	18kΩ	1-249-432-11	330kΩ	1-247-891-00		
3.6Ω	1-247-772-00	62Ω	1-247-802-11	1.1kΩ	1-247-832-11	20kΩ	1-247-862-11	360kΩ	1-247-892-11		
3.9Ω	1-249-388-11	68Ω	1-249-403-11	1.2kΩ	1-249-418-11	22kΩ	1-249-433-11	390kΩ	1-247-893-11		
4.3Ω	1-247-774-00	75Ω	1-247-804-11	1.3kΩ	1-247-834-11	24kΩ	1-247-864-11	430kΩ	1-247-894-11		
4.7Ω	1-249-389-11	82Ω	1-249-404-00	1.5kΩ	1-249-419-11	27kΩ	1-249-434-11	470kΩ	1-247-895-00		
5.1Ω	1-247-776-00	91Ω	1-247-806-11	1.6kΩ	1-247-836-11	30kΩ	1-247-866-11	510kΩ	1-247-896-11		
5.6Ω	1-249-390-11	100Ω	1-249-405-11	1.8kΩ	1-249-420-11	33kΩ	1-249-435-11	560kΩ	1-247-897-11		
6.2Ω	1-247-778-00	110Ω	1-247-808-11	2.0kΩ	1-247-838-00	36kΩ	1-247-868-11	620kΩ	1-247-898-11		
6.8Ω	1-249-391-11	120Ω	1-249-406-11	2.2kΩ	1-249-421-11	39kΩ	1-249-436-11	680kΩ	1-247-899-11		
7.5Ω	1-247-780-00	130Ω	1-247-810-11	2.4kΩ	1-247-840-00	43kΩ	1-247-870-11	750kΩ	1-247-900-11		
8.2Ω	1-249-392-11	150Ω	1-249-407-11	2.7kΩ	1-249-422-11	47kΩ	1-249-437-11	820kΩ	1-247-901-11		
9.1Ω	1-247-782-00	160Ω	1-247-812-11	3.0kΩ	1-247-842-11	51kΩ	1-247-872-11	910kΩ	1-247-902-11		
10Ω	1-249-393-11	180Ω	1-249-408-11	3.3kΩ	1-249-423-11	56kΩ	1-249-438-11	1.0MΩ	1-247-903-00		

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